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PRINCIPLES OF
LOCAL TREATMENT
—
CHEEVER SHATTUCK, M.D.

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PRINCIPLES OF MEDICAL TREATMENT

BY
GEORGE CHEEVER SHATTUCK, M.D.
*Assistant Physician to the Massachusetts
General Hospital*

THIRD EDITION
REVISED AND ENLARGED



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TO
WILLIAM HENRY SMITH, M.D.
TEACHER IN MEDICINE
AND
FRIEND TO MANY

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PREFACE.

This work represents an attempt to offer clearly and concisely sound principles of treatment based on known pathology. The methods described are selected from those that have been tried at the Massachusetts General Hospital or in private practice. Most of them have been taught by Prof. F. C. Shattuck, Dr. William H. Smith or others on the staff of the Hospital or of the Harvard Medical School. It is not to be supposed that any of these men subscribe fully to everything here set forth or that further advance will not require revision.

The writer wishes here to express his deep appreciation of the debt which he owes to his teachers in medicine, of their kindness to pupils and of their humanity to patients.

Brevity being essential to the writer's purpose, this synopsis is necessarily incomplete. The book was prepared primarily for use in the Harvard Medical School.

PREFACE TO SECOND EDITION.

In this edition, as in the first, completeness has been sacrificed to brevity, but new material has been added and many changes have been made.

More reliance than before has been placed on personal experience, but the information about salvarsan was derived, chiefly, from recent literature.

It is a pleasure to acknowledge the assistance and helpful criticism of friends and, notably, that of Mr. Godsoe, Pharmacist of the Massachusetts General Hospital.

G. C. S.

PREFACE TO THIRD EDITION.

This book has grown considerably since the first edition appeared, and the original name, "A Synopsis of Medical Treatment" has been criticized on the ground that it gave an inadequate idea of the scope of the book. I was the more ready to change the title because, from the first, it has been my desire to subordinate methods and to emphasize principles. Accordingly the name of the book has been changed to "Principles of Medical Treatment."

I count it a piece of rare good fortune to be able in this edition to publish new material on some of the acute infections by Dr. Edwin H. Place and on tuberculosis by Dr. John B. Hawes 2nd, men whose work in their respective fields is so favorably known as to render comment unnecessary. G. C. S.

CHAPTER I.

CARDIAC INSUFFICIENCY.

GENERAL PRINCIPLES OF TREATMENT.

- A. REST.
- B. DEPLETION.
- C. STIMULATION.
- D. SUITABLE DIET.
- E. REGULATION OF MODE OF LIFE.

The principles are much the same whatever the underlying cause. Treatment must, however, be regulated to suit the severity of symptoms, to meet individual needs, and for varieties of disease.

An exact diagnosis may be difficult in the presence of severe insufficiency and may not be necessary at first, but accuracy in diagnosis is very important for prognosis and for planning treatment for the future.

METHODS OF TREATMENT.

A. Rest.

1. Semirecumbent position in bed or chair.
2. Minimum exertion.
3. Relieve discomfort and secure sleep. If there is much discomfort morphine subcutaneously is indicated.

B. Depletion.

1. **Purgation.** Obtain watery catharsis more or less profuse according to amount of edema.

When edema is absent or slight avoid excessive purgation lest exhaustion result.

Magnesium sulphate (p. 201) is useful as a purgative.

2. Limitation of Liquids. Total liquids, including liquid foods, should not exceed three pints in twenty-four hours. One pint in twenty-four hours is near the minimum. The patient should not be allowed to suffer from thirst. It may be relieved by sucking cracked ice or by gargling.

3. Diuresis should follow the use of digitalis. In mild cases of insufficiency, rest, purgation and limitation of liquids with or without digitalis may suffice.

When edema is persistent or extreme, diuretics should be prescribed. Theobromine (p. 199) or its substitutes may be expected to act well provided the kidneys are not severely damaged. Calomel should not be given if the patient has nephritis because salivation may result. Apocynum, theocine or theophylline may act better than theobromine in some cases.

4. Venesection. Indicated occasionally when there is engorgement of the right ventricle with marked evidence of venous stasis; *e.g.*, dyspnoea, cyanosis, pulmonary edema and engorgement of neck-veins and liver.

A pint of blood or even more may be withdrawn. Venesection is contraindicated by emaciation or by marked weakness or anemia. Blood is generally withdrawn by incising a vein on the inner side of the elbow. A tourniquet may be put around the arm to render the veins prominent. The incision should be made in the long axis of the vein with the point of a sharp knife. The bleeding can be stopped with a pad and bandage. Suturing the vein is unnecessary.

5. Leeching. Useful as a substitute for venesection when the latter would be undesirable or when symptoms are less severe. Leeching will generally relieve painful engorgement of the liver.

Apply a dozen leeches over the right hypochondrium and allow them to remain until they drop off. The abdomen should then be covered with a large, moist, absorbent dressing to favor oozing from the bites. A drop of milk placed on the skin encourages the leech to bite. Salt causes him to let go.

6. Tapping. Necessary when fluid in the chest or abdominal cavity seriously embarrasses the heart or respiration.

C. Stimulation.

Digitalis (p. 195) is the best cardiac stimulant (other drugs may be preferred occasionally). A good tincture * of digitalis ordinarily acts well. If after pushing digitalis no effects are apparent the preparation is probably bad. When given by mouth in sufficient dosage its action should be apparent in from twenty-four to forty-eight hours. When quicker results are needed an initial dose of 30 min. (or 2 c.c.) may be injected into the gluteal muscle.

When prompt effects are desirable digipuratum (p. 197) can be used. When given by mouth it should act in from twelve to twenty-four hours. Digipuratum-solution injected intramuscularly may show effects in from $\frac{1}{2}$ to 1 hour. It acts more quickly when used intravenously. For very urgent insufficiency strophanthin may be used intravenously. It is dangerous (p. 197).

Caffeine sodio-salicylate is believed to promote diuresis when used in conjunction with digitalis. For this purpose the caffeine should be used subcut. in repeated doses of from 1 to 3 grs. (or 0.06 to 0.2 gm.).

Black coffee or caffeine citrate may be tried by mouth. Caffeine may cause restlessness or insomnia.

Slight exacerbations of dyspnoea or distress can often be relieved by a quickly diffusible stimulant, *e.g.*:

By mouth:

- (a) Spiritus ammoniæ aromaticus: 1 drach. (or 4 c.c.).
- (b) Whiskey or brandy: from $\frac{1}{2}$ to 1 oz. (or 15 to 30 c.c.).

Subcutaneously:

- (c) Camphor in oil: † 3 grs. (or 0.2 gm.). Inject intramuscularly.
- (d) Cocaine hydrochloride: from $\frac{1}{4}$ to $\frac{1}{2}$ gr. (or 0.008 to 0.016 gm.). It is said to be dangerous but may act very well.

* Many prefer powdered leaves in pill-form.

† Should be specially prepared for subcut. use.

Insufficiency with much pain requires morphine (p. 191). It seems to act under these circumstances as an efficient cardiac stimulant. It brings also physical comfort and psychic relief which favor recuperation. The morphine should be used subcut. under these circumstances to ensure prompt effect.

D. Diet.

Spare the patient unnecessary effort, particularly if there is much dyspnoea, by ordering food which is easy to swallow and which requires no chewing.

By frequent small feedings and by avoiding gas-producing foods seek to prevent cardiac embarrassment from distention.

Emaciated patients should take as much concentrated nourishment as is practicable in order to strengthen the heart muscle by improved nutrition.

Fat or plethoric individuals may benefit by fasting.

E. Regulation of Mode of Life.

To prevent relapse during and after convalescence, the mode of life of the patient must be wisely regulated; and intelligent coöperation between patient and physician is essential to this end. It is generally necessary to tell the patient something about his condition and to warn him to avoid activities which induce much fatigue and exertions which cause much dyspnoea.

Judgment and caution must be exercised in dealing with an apprehensive patient lest danger be exaggerated in his mind, and harm result. After a sufficient period of complete rest the patient should be encouraged to take regular exercise within the limits of tolerance in order to strengthen the heart by promoting hypertrophy.

Exercise and work should be resumed very gradually under close supervision.

CLASSIFICATION OF VALVULAR DISEASE.

- | | |
|-------------------|--|
| 1. Congenital . . | { Most commonly discovered in early childhood. |
| 2. Infectious . . | Most commonly discovered in youth. |
| 3. Syphilitic . . | { Most commonly discovered in middle life. |
| 4. Degenerative . | Most commonly discovered in old age. |

NOTES ON PATHOLOGY AND DIAGNOSIS.

1. **Congenital lesions.** Pulmonic stenosis is the most common. It is seldom mistaken for other types of lesion but may easily be confused with anomalies which have similar signs and which are often combined with it.

2. **Infectious lesions:**

(a) Active stage. Inflammation of valves due to presence of bacteria on the valve.

(b) Obsolete stage. Valves deformed and scarred as a result of inflammation.

(c) Recurrent stage. Reinfection with inflammation at site of old lesion.

Lesions are found commonly at the mitral valve or at the aortic and mitral valves, seldom at the aortic valve alone. Occasionally the mitral, aortic and tricuspid valves are all diseased. Stenosis develops frequently.

Obsolete lesions if well compensated may give no symptoms. They first attract attention by diminished cardiac efficiency or by failure of compensation.

In the active or recurrent stage the symptoms are those of general infection with or without failure of compensation.

3. **Syphilitic lesions.** The lesion generally begins in the ascending aorta and extends subsequently to the aortic valve. The earliest signs may be slight dilatation of the arch and the murmur of aortic roughening. Later, that of aortic regurgitation may appear and, finally, relative mitral regurgitation may develop.

A lesion of the aortic valve only, in a young adult, suggests syphilis as its cause. Aneurism or coronary endarteritis may coexist as part of the same process.

Evidence of an old syphilis supports the diagnosis.

4. **Degenerative lesions.** As in syphilis, the signs point to a lesion at the aortic valve but evidence of syphilis is lacking. The background is one of senility and general arteriosclerosis to which sclerosis of the aorta and of the aortic valve is incidental. There may be dilatation of the arch and evidence of myocardial degeneration, perhaps also angina pectoris.

Note. — All the types of lesion enumerated above may be followed in time by cardiac insufficiency.



TREATMENT FOR TYPES OF VALVULAR DISEASE.

I. Congenital and Obsolete Infectious Lesions of Valves.

Treat according to the general principles given above.

They must be modified for the individual with regard to severity, duration, nature and cause of symptoms.

II. Active Infectious Lesions of Valves.

A. Principles of Treatment. As for acute infections in general (p. 23) and for cardiac insufficiency if present.

1. Rest in bed.
2. Minimum exertion.
3. Dilution of toxins.
4. Elimination of toxins.
5. Maintenance of nutrition.
6. Stimulation *p.r.n.*

Note. — The infection may be acute, subacute or recurrent. The chief dangers are from toxemia, exhaustion, cardiac dilatation or embolism.

A history of recent preëxisting rheumatic fever, chorea or tonsillitis strengthens a diagnosis of active endocarditis.

B. Methods. (a) Good nursing is very important. The nurse should promote comfort by attention to details, should feed the patient and, whenever possible, spare him exertion or annoyance.

(b) To dilute toxins and to favor elimination order abundance of liquids. Have intake and output recorded. If cardiac dilatation threatens or if there is edema liquids must be restricted.

(c) Feedings should be frequent, the food nutritious, and the amount regulated by digestive power. Liquids and soft solids are preferable in severe cases because easy to swallow.

(d) Stimulants are to be avoided unless clearly necessary because embolism is to be feared and stimulation might favor it.

(e) Tachycardia may sometimes be reduced by an ice-bag placed over the præcordia.

C. Convalescence. To minimize danger of relapse keep the patient in bed and as quiet as possible for weeks or months after

the pulse and temperature have returned to normal. Permanent damage nearly always remains. The degree of possible improvement depends on the location and extent of the lesions and on the recuperative power of the patient. Therefore, guard against strain, and treat malnutrition or anemia, if present, to promote hypertrophy of the heart.

D. Prophylaxis. (a) Search for and eliminate all foci of infection in sinuses, teeth, tonsils, or genito-urinary tract.

(b) Diseased tonsils, as a rule, should be removed at the first suitable opportunity. It is dangerous to remove them when acutely inflamed.

(c) Warn the patient against exposure and insist that he attend promptly to ailments, even if slight, and avoid mental strain, and any physical exertion which produces dyspnoea or fatigue.

III. Syphilitic Lesions of Valves require antisyphilitic medication as well as general measures for cardiac insufficiency.

Little improvement can be expected, however, unless the diagnosis be made before extensive and irreparable damage has occurred.

IV. Degenerative Lesions of Valves may be treated on general principles with certain modifications as follows:

(a) When blood-pressure is high, nitrites may be of value to lighten the work of the heart by lowering pressure temporarily.

(b) Thin patients require the maximum nutrition to strengthen the heart. They should undergo little or no purgation unless edema is considerable.

(c) Regulation of life is of the utmost importance during and after convalescence. The patients' coöperation must be secured.

(d) Many of these patients should take digitalis and salts more or less frequently for long periods or for the rest of their lives. The best dosage for the individual can be determined only by trial. Several small doses per week taken at regular intervals may be sufficient. Warn the patient not to be without his medicine or to give it up on his own responsibility. The heart muscle may, perhaps, be so changed that it cannot respond to any form of treatment.

HYPERTENSION WITH CARDIAC INSUFFICIENCY.

Etiology and Symptoms. Hypertension is commonest in chronic nephritis and is seen also in arteriosclerosis. The hypertension and left ventricular hypertrophy develop gradually. Symptoms of insufficiency often increase so gradually as to be disregarded by the patient for months. The condition of the patient is generally more critical than the signs would seem to indicate. Acute pulmonary edema is common in these cases. Many of them show signs of toxemia attributable to deficient renal elimination.

Treatment. 1. Methods for cardiac insufficiency (p. 13).

2. Reduce the work of the heart by lowering blood-pressure temporarily unless the urinary output falls in consequence.

(a) Vaso-dilators, *e.g.*, nitroglycerin (p. 197), lower blood-pressure temporarily and often promote diuresis also.

(b) Purgation, diuresis, venesection and measures tending to relieve toxemia or to improve the circulation seem to favor if not to cause reduction of pressure in hypertension.

(c) Fasting for a day or marked restriction of food for several days may benefit plethoric individuals. It is one of the surest means of lowering pressure. Emaciation must be avoided because it increases cardiac weakness.

(d) Relief from psychic strain, *e.g.*, business cares, may be followed by a fall in pressure.

3. When toxemia is present reduce it by:

(a) Purgation or diuresis.

(b) Restriction of food, and of proteid in particular.

(c) Hot-air baths or hot soaks if cardiac symptoms permit.

4. If toxic symptoms persist after improvement in the circulation they are probably uremic in origin and should be treated accordingly (p. 59).

ACUTE PULMONARY EDEMA IN HYPERTENSION.

Notes.—Occurs commonly and characteristically in hypertension. The attack generally follows exertion and may not have been preceded by marked symptoms of cardiac insufficiency. The onset is sudden and alarming.

The symptoms are severe dyspnoea, cyanosis, wheezing, cough, and pinkish, frothy expectoration. There may be præcordial pain.

Treatment. Mild attacks may pass off after a little rest. Severe attacks require energetic and prompt treatment as follows:

1. Prop the patient up so he can sit upright without effort.
2. Give morphine sulphate, gr. $\frac{1}{4}$ (or 0.016 gm.) atropine sulphate, gr. $\frac{1}{16}$ to $\frac{1}{8}$ (or 0.00065 to 0.001 gm.) and nitroglycerin, gr. $\frac{1}{16}$ to $\frac{1}{8}$ (or 0.00065 to 0.001 gm.) subcutaneously at once.
3. Unless improvement begins promptly, the nitroglycerin should be repeated, and venesection may be required.
4. The following drugs may be of service.

By inhalation:	Amyl nitrite: 5 m. (or 0.3 c.c.).
	Spiritus ammoniæ aromaticus: 1 drach. (or 4 c.c.).
By mouth:	Spiritus ætheris compositus: * 1 drach. (or 4 c.c.).
	Whiskey or brandy: from 4 drach. to 1 oz. (or 15 to 30 c.c.).
Subcutaneously:	Cocaine hydrochloride: $\frac{1}{4}$ gr. (or 0.016 gm.); said to be dangerous.
Intravenously:	Strophanthin: <i>dangerous</i> (p. 197).

5. Do not attempt to transport the patient until immediate danger has passed.
6. Rest in bed is advisable for a few days to allow the heart to recover itself.
7. Digitalis, purgation, etc., may be needed.
8. Subsequent regulation of life is essential to avoid recurrence.

Pulmonary Edema without Hypertension. Pulmonary edema may appear in cardiac insufficiency from any cause. It is common in mitral stenosis, but seldom acute enough to require special treatment. When severe it should be treated as in hypertension, except, that the blood-pressure being normal or low, nitrites are of doubtful value and may perhaps do harm.

* "Hoffmann's anodyne."

Pulmonary edema occurs also in infectious diseases. In pneumonia it may be very acute, but is not necessarily of cardiac origin. For treatment see p. 33; also "Typhoid Fever," pp. 71, 75, and "Pneumonia," p. 125.

CIRCULATORY DISORDERS IN THE INFECTIOUS DISEASES.

Note. — Common in acute infections, particularly in pneumonia and in septic states. The circulatory disturbances may be attributed to one of the following causes or to a combination of them.

A. CAUSES.

1. Faulty innervation of the heart due to toxemia.
2. Cloudy swelling of myocardium due to toxemia.
3. Ill-nourished myocardium secondary to emaciation or anemia.
4. Infection of the valves, myocardium or pericardium.
5. Lesions obstructing the pulmonary circulation, *e.g.*, embolism of the pulmonary artery or of its large branches.
6. Vascular relaxation due to toxemia.

B. TREATMENT IN GENERAL.

1. Dilute, eliminate or neutralize toxins.
2. Minimize exertion.
3. Prevent abdominal distension.
4. Strive to maintain nutrition.
5. Emaciated patients, capable of taking little food, sometimes do well on large doses of alcohol which seem to act for them as a food and indirectly as a stimulant.
6. Cardiac stimulants must often be tried empirically from lack of a precise diagnosis or as a last hope. They often fail to do good.

C. TREATMENT IN PARTICULAR.

I. Cardiac Disorders.

1. **Faulty Innervation.** Alcohol, digitalis, strychnine or ice-bag, etc., may be tried but are not likely to avail much.
2. **Cloudy Swelling.** Digitalis, caffeine or camphor may be tried.

3. **Ill-nourished Myocardium** demands improved nutrition of the patient. Alcohol and stimulants may perhaps help.

4. **Cardiac Infection.** Treat as for active infectious endocarditis, p. 23.

5. **Obstruction in the Lung.** As a rule nothing can be done.

6. **Pulmonary Edema** occasionally yields promptly to atropine, used subcutaneously. Cardiac stimulants or strophanthin (*dangerous*, p. 197) may be tried. Venesection may do good if the edema be attributable directly to cardiac dilatation.

II. Vascular Relaxation: "Vasomotor Paresis."

Notes. — The relaxation is believed to be the result of the action of toxins on nerves or blood-vessels. It occurs occasionally in severe infections, particularly in typhoid and in pneumonia. The condition is analogous to surgical shock although its cause is not the same.

The onset may be gradual or rapid. It can be observed, by watching the development, that the pulse becomes weak while the heart-sounds are still of good quality. Later, as a result of low peripheral pressure and meager return of blood to the heart, the heart's action becomes more and more rapid, the sounds fainter and perhaps irregular. Finally, the extremities become cold, the face pale and the pulse imperceptible.

Principles of Treatment. Promote return of blood to the heart by:

- (a) Filling the vessels, or by
- (b) Constriction of vessels.

Methods: 1. Salt solution used by hypodermoclysis is rapidly absorbed and generally acts well in from five to fifteen minutes. It may save life even when the patient's condition is very bad. A pint, heated to blood-temperature, should be used at a time. It may be repeated in an hour or later if needed. The administration of frequent doses of salt solution in this way may lead to cardiac dilatation unless excretion be rapid.

Salt solution may be given intravenously in very critical conditions.

When the need for salt solution can be anticipated the means of administering it should be kept in readiness.

2. Direct transfusion of blood might be tried if it could be done without delay.

3. Adrenalin chloride is a very powerful vaso-constrictor but very transient in its effect. It is difficult to get satisfactory results with it.

Pituitrin has an effect on blood-pressure like adrenalin, but milder and less transient. It may be tried safely.

Caffeine sodio-salicylate, 3 gr. (or 0.2 gm.), may be tried subcutaneously, but is not very effective as a vaso-constrictor.

ANGINA PECTORIS.

Definition. Pain or distress attributable to spasm, or to occlusion, of a coronary artery.

Spasm is generally associated with syphilitic or degenerative change in the vessel-wall, but lesions may be confined to other parts of the heart or to the aorta, and "neurotic angina," in which there is no known lesion, is rather common. Occlusion may be thrombotic or embolic.

Angina may be indicative of threatened exhaustion or of deficient blood-supply to the myocardium.

Etiological Classification of Angina Pectoris.

1. Syphilitic: common in men of early middle age.
2. Degenerative or arteriosclerotic: common in old men.
3. Embolic: seen in endocarditis or intracardiac thrombosis.
4. Neurotic: common in young women.

DIAGNOSIS.

An accurate history of the mode of onset, duration and radiation of the pain and the discovery of an adequate background for the disease is of the greatest importance. Pain on exertion suggests angina. Angina in a young or middle-aged man suggests syphilis.

A complete physical examination may show nothing important.

Angina in a young woman suggests psychic trauma.

Painless angina, otherwise typical, is seen rarely.

I. SYPHILITIC ANGINA.

Pathology. Syphilitic changes in the aorta, aortic valves or coronary arteries, diminishing their circulation are generally demonstrable.

Etiology. A late manifestation of syphilis; commonest in middle life.

Prognosis. The prognosis is very uncertain.

A. Treatment in General.

1. Antisymphilitic measures.*
2. Regulation of life to reduce demands on the heart to what it can meet is of the utmost importance.
 - (a) Avoid anything known to bring on angina in the individual, *e.g.*, exercise after meals.
 - (b) Avoid *physical* and *mental* strain.
 - (c) Avoid distention of the stomach and bowels.
 - (d) Food and liquids should be taken in moderation.
 - (e) Tobacco and alcohol in great moderation if at all.
 - (f) Bowels should be kept free.

3. Cardiac insufficiency, if present, requires appropriate treatment on general principles.

4. Small doses of digitalis often help to reduce the number of attacks even when the usual signs of cardiac insufficiency are absent. Theobromine sodio-salicylate, grs. 5 t.i.d., or barium chloride, grs. $\frac{1}{8}$ t.i.d., may be tried for the same purpose.

5. At the first sign of an attack the patient should take nitroglycerin (p. 197) or amyl nitrite, repeat it in a few minutes if not relieved and remain quiet for a time after the attack has passed. An expected attack can sometimes be prevented by timely use of nitroglycerin. The drug must be always accessible without effort. Nitroglycerin should be chewed and absorbed in the mouth and amyl nitrite taken by inhaling it from a handkerchief. It is important to provide pearls which break easily but not spontaneously if amyl nitrite is to be used.

B. Treatment of Anginal Attacks.

If called to treat an attack of angina use nitroglycerin subcutaneously or amyl nitrite or both immediately. Repeat the dose in a few minutes if the patient is not relieved. If nitroglycerin gives no effect in repeated doses amyl nitrite may perhaps relieve. If the pain is unusually severe and obstinate morphine may be injected.

Do not attempt to transport the patient and do not allow him to make the slightest exertion for a time after the symptoms have passed. Rest in bed is advisable after a severe attack.

That which is known to bring on an attack must be avoided.

* It is doubtful whether Salvarsan should be used in the presence of severe cardiac disease.

II. DEGENERATIVE ANGINA.

Pathology. Coronary sclerosis and chronic myocardial degeneration, with or without fibrous myocarditis, will often be demonstrable as part of a widespread arteriosclerosis.

Prognosis. Years of life may be possible but sudden death may occur at any time.

Treatment. 1. Regulate life to avoid strain.

2. When there is any cardiac insufficiency the patient should take digitalis and salts for long periods. The dose required for the individual must be determined carefully by trial.

3. Digitalis, theobromine, potassium iodide or barium chloride in small doses may limit the number of attacks or even prevent them.

4. If an old syphilis be suspected give potassium iodide and protiodide of mercury in moderate doses.

5. The treatment for the attack is the same as in syphilitic angina.

III. EMBOLIC ANGINA.

Vaso-dilators are likely to give little relief. Morphine is usually required in large doses. (Death may come suddenly at onset of symptoms.)

IV. NEUROTIC ANGINA.

Pathology. No characteristic changes recognized.

Etiology. Commonly due to excess in tea, coffee, or tobacco, to fear or emotional shock and often associated with debility. It is seen, almost exclusively, in neurotic young women.

Prognosis. Death is not to be expected and the chance of complete cure is excellent.

Treatment. 1. Remove the cause when possible.

2. General hygienic measures.

By these means recurrence can be prevented.

The attack is generally too brief and mild to require treatment, but when severe, it should be treated like organic angina.

CHAPTER II.

NEPHRITIS.

CLASSIFICATION.

- | | |
|-----------------------------------|----------------------|
| 1. Acute Renal Irritation. | } Allied Conditions. |
| 2. Acute Nephritis. | |
| 3. Chronic Nephritis. | |
| 4. Syphilitic Nephritis. | |
| 5. Arteriosclerotic Degeneration. | |
| 6. Passive Congestion. | |

NOTES ON CLASSIFICATION.

This classification aims to separate only the more important types of nephritis which can be recognized clinically and which require different treatment.

Acute renal irritation, acute nephritis * and chronic nephritis appear to be allied diseases. The gaps between them are bridged by intermediate forms and the acute infectious diseases are responsible for most cases of these three types of renal inflammation. Toxic irritation differs from acute nephritis mainly in degree, and chronic nephritis from acute nephritis in that instead of recovering it progresses, though it may be slowly.

Although arteriosclerotic degeneration is essentially different from chronic nephritis, the latter being primarily an inflammation of the kidney and the former being a degeneration secondary to vascular disease, the two are often combined. In such combinations either process may predominate.

Besides intermediate or mixed forms of nephritis there are the rare amyloid degeneration and a variety of forms difficult to classify.

* The recent work of H. Cabot and Crabtree seems to show that glomerular nephritis is caused by the streptococcus viridans.

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RECOGNITION OF TYPES OF NEPHRITIS.

Acute Renal Irritation is distinguished from acute nephritis by less profound changes in the urine, absence of symptoms of renal insufficiency and prompt recovery after removal of the cause. It is frequently symptomatic in acute fevers.

Acute Nephritis * is common in childhood and youth. It is generally traceable to an acute infectious disease, is often found after scarlet fever and may follow tonsillitis or result from an irritant poison. Acute nephritis differs much in severity and consequently in signs and symptoms. Severe cases may show anuria or marked oliguria with anasarca and perhaps uremia. The urine in these cases is loaded with blood, albumen, casts and fat, and that of mild conditions contains the same elements in smaller amount. Blood-pressure may be moderately elevated, and if the disease persists for some weeks, left ventricular hypertrophy may develop.

Chronic Nephritis. The etiology is like that of acute nephritis, as a rule, but there are some cases arising from chronic toxemias.

Stages.	1. Early.	} Phases.	a. Latent.
	2. Subacute.		b. Exacerbation.
	3. Chronic.		

The course of the disease may run from a few years or less to twenty years or more. Any stage may be without symptoms. The early stage may be indistinguishable from acute nephritis, and exacerbations may be mistaken for acute nephritis. Left ventricular hypertrophy and hypertension develop gradually and there is a progressive fall in the specific gravity of the urine associated with an increase in the amount of urine.

The late stage shows marked left ventricular hypertrophy, a blood-pressure generally over 200 mm. of mercury and a urine of very low gravity, containing little or no albumen and a scanty sediment. At this stage many of the glomeruli and much of the parenchyma has been replaced by connective tissue, and shrinkage has followed so that the kidneys are much diminished in size. The chief dangers are from uremia or from cardiac

* The acute nephritis produced by the irritant poisons such as corrosive sublimate is of the tubular variety, whereas that of the acute infections is of the glomerular type and is caused by a streptococcus.

insufficiency secondary to hypertension. In the absence of arteriosclerosis a provisional diagnosis of chronic nephritis may often be made by the evidence of hypertension and of cardiac hypertrophy. Cases of chronic nephritis complicated with arteriosclerosis are liable to apoplexy.

Syphilitic Nephritis is generally regarded as an unusual form of acute nephritis. It occurs, according to Osler, most commonly in the secondary stage of syphilis within six months of the primary lesion and it resembles glomerular nephritis. Gumma of the kidney is rarely seen but it is probable that some instances of renal arteriosclerosis are of syphilitic origin. Signs of an active syphilis in the presence of a nephritis suggest but do not prove that the two are related.

Arteriosclerotic Degeneration of the kidney is most common in old age. It may be part of a widespread arteriosclerosis or it may be manifested chiefly in the kidney. There occurs a non-inflammatory destruction of parts of the kidney dependent on sclerosis of the arteries supplying those parts. Local shrinkage and irregularity or roughness of the surface results.

The urine, at first, may show considerable albumen and some blood and casts. Later it resembles that of chronic nephritis. Hypertension and left ventricular hypertrophy are generally well marked in the later stages of renal degeneration.

The greatest dangers are from cardiac insufficiency or cerebral hemorrhage. Typical uremia occurs rarely if at all in pure degenerative cases but there is often more or less chronic nephritis combined with the degenerative lesions. Chronic lead-poisoning, gout or syphilis may be important etiologically.

Passive Congestion is secondary to congestion in the venous circulation. Therefore, it is commonly symptomatic of cardiac insufficiency. The urine is high colored, scanty and of a high gravity. Albumen and casts are found, varying in amount and number. There are no uremic symptoms, and the urine clears rapidly after removal of the congestion.

Passive congestion may mask an acute nephritis, especially in the active stage of endocarditis.

ACUTE RENAL IRRITATION.

Treatment. The signs of irritation can be much reduced by the free administration of water. The water dilutes the irri-

tating substance and promotes excretion by stimulating diuresis. No other direct treatment is needed.

Caution. Make sure that a nephritis is not developing.

ACUTE NEPHRITIS.

PRINCIPLES OF TREATMENT.

A. Reduce the demands on the kidney by:

1. Rest in bed.
2. Elimination by other channels. $\left\{ \begin{array}{l} (a) \text{ Purging.} \\ (b) \text{ Sweating.} \end{array} \right.$
3. Suitable diet.
4. Limitation of liquids in suitable cases.

B. Maintain nutrition.

C. Avoid exposure to cold or to sudden cooling.

D. Drugs should be used only when indicated; never by routine.

METHODS OF TREATMENT.

- Sweating.***
1. Hot-air bath in bed or chair.
 2. Hot tub-bath.
 3. Hot wet pack.
 4. Electric light bath.
 5. Turkish or Russian bath.

Hot-air baths are best given in bed. If the baths cause profuse sweating they may be used daily for an hour or more. If sweating does not begin promptly a drink, hot or cold, may start it, or pilocarpine may be administered subcutaneously. Pilocarpine may cause pulmonary edema and is, therefore, contraindicated when the heart is weak, the lungs congested, or the patient unconscious. Some patients who sweat little at first respond well to subsequent baths.

If sweating cannot be induced, if the pulse becomes weak, or if the patient develops cardiac symptoms during a bath the baths must be given up. They should not be ordered for an unconscious patient without consideration followed by close observation.

Hospitals provide apparatus for the hot-air bath. In private

* The value of sweating is in dispute.

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houses it can be improvised with barrel-hoops or strong wire to arch the bed, an oilcloth from the kitchen table as a rubber sheet, an elbow of stovepipe and a kerosene lamp to provide the heat; or the patient, without clothing, may sit in a cane-bottomed chair under which stands a small lamp. Blankets are then wrapped around the chair and the patient together, leaving no hole for the heat to escape.

Care must be taken not to set the blankets on fire.

Purgation. Obtain watery catharsis to reduce edema and to increase elimination of toxic material by the intestinal tract. Magnesium sulphate, or compound jalap powder with additional potassium bitartrate, or elaterium are good for this purpose (p. 201).

In the absence of edema, purgation should not be excessive, lest the patient's nutrition suffer.

Diet. Proteids, meat broths, spices, acids and alcohol irritate the kidney and are to be avoided during the acute stage.

Milk is an exception to the rule against proteid because experience shows that it is not injurious. A diet exclusively of milk becomes monotonous if long continued and such large quantities are needed to maintain nutrition that the fluid part may tend to increase edema.*

Salt seems not to be harmful as a rule. When, however, edema persists in spite of other treatment, a "salt-free" diet may be tried, *i.e.*, salt is not to be added to food either before or after cooking. This change is followed occasionally by rapid disappearance of the edema. If deemed advisable the phosphate† in milk can be precipitated by adding 5 grs. (or 0.3 gm.) of calcium carbonate per pint of milk.

Diet List (incomplete). Milk, cream, butter, sugar, junket, ice cream, bread, toast, cereals, rice, potato, macaroni, sago, tapioca, spinach, lettuce, sweet raw fruits or stewed fruits.

In convalescence enlarge diet cautiously on account of danger of relapse. When returning to proteid foods allow eggs first, then fish and lastly meat, red or white.

* Three quarts of milk furnish about 2000 calories which is scant for an adult.

† One liter of milk contains 3.80 gm. of phosphate and 1.79 gm. of chlorides; Sommerfeld, "Handb. d. Milchkunde," p. 271.

Liquids, including liquid foods, should be limited strictly when there is anasarca or when they are not being fully excreted. One pint in twenty-four hours may be enough. Cracked ice may be used for thirst, but, if the patient suffers, more liquid should be allowed.

Water is an excellent diuretic when freely excreted. It dilutes irritating substances and favors their elimination.

Nutrition. The quantity of food to be prescribed depends on the severity of the nephritis, the physical strength, and the state of nutrition of the patient. Strong, well-nourished patients having severe nephritis may benefit by fasting for a day followed by very small quantities of food for several days. A feeble, emaciated and anemic person should receive food enough to maintain body-weight.

Exposure. To prevent chill, keep room at equable temperature and let patient wear flannel or lie between blankets.

Medication. Irritating diuretics, such as calomel, are dangerous in all forms of nephritis.

Theobromine, theocine and apocynum are useless and may perhaps do harm in acute nephritis.

Mild saline diuretics or alkaline mineral waters may be valuable, particularly in convalescence, but it may, perhaps, be wiser to avoid them in severe cases during the early stage.

For anemia, iron may be tried, *e.g.*, Bland's Pill, or Basham's Mixture (Liquor ferri et ammonii acetatis N. F.) which contains iron and acts also as a mild diuretic.

Prophylaxis. If it appears that the tonsils were the point of entrance or the original seat of disease their removal at a suitable time should be advised.

Uremia. For treatment see p. 59.

CHRONIC NEPHRITIS.

PRINCIPLES OF TREATMENT.

1. Adequate nourishment is essential because the disease is chronic and a cure not to be expected.
2. Limit demands on the kidney and guard against uremia by (a) diet, (b) elimination.
3. Guard against cardiac insufficiency by avoiding physical and mental strain.
4. Avoid exposure to cold.

METHODS.

Methods are the same in general as for acute nephritis, but they must be applied with regard to the condition of the patient and the stage and severity of the disease.

Avoid unnecessary restrictions.

The Early Stage, when severe, must be treated as acute nephritis until recognized as chronic. Nutrition then becomes a more important problem.

Exacerbations are treated like acute nephritis except that nutrition is more important than in acute nephritis and therefore diet should be more liberal.

Latent phase: early, subacute, or chronic:

1. Restrict more or less the following:

(a) Meats.	(d) Alcohol.
(b) Meat broths.	(e) Acids.
(c) Spices.	(f) Salt.
2. To favor elimination of toxic material the following may be advised:
 - (a) A saline cathartic every second, third, or fourth day. Bowels must be kept free.
 - (b) Hot tub-baths, Russian, or Turkish baths twice weekly.
 - (c) Alkaline mineral waters with meals.
3. **Uremia.** For treatment see p. 59.
4. **Cardiac Insufficiency** demands prompt recognition and treatment. It results commonly from hypertension, p. 27.

SYPHILITIC NEPHRITIS.

1. Apply principles advised for acute or chronic nephritis according to the severity and symptoms of the case.

2. Iodide and mercury or salvarsan should be used in small doses.

5. Watch urine and omit mercury if renal irritation increases under treatment. When the diagnosis is correct the urine generally improves promptly. As there are no characteristic signs mistakes of diagnosis easily occur.

ARTERIOSCLEROTIC RENAL DEGENERATION.

TREATMENT.

1. Search for a cause of arteriosclerosis. If such can be found and if it is believed still to be operative treat it appropriately.

Such causes are, *e.g.*, (a) chronic lead-poisoning; (b) gout; (c) syphilis; (d) prolonged worry.

2. Nutrition must be maintained.

3. Limit the demands on the kidney by moderate restriction of:

(a) Meats.

(d) Alcohol.

(b) Meat broths.

(e) Acids.

(c) Spices.

4. *Avoid physical and mental strain* to guard against (a) cardiac insufficiency; (b) cerebral hemorrhage.

5. Cardiac insufficiency, when present, should be treated with reference to its probable cause, *e.g.*:

(a) Degenerative valve lesion, p. 25.

(b) Degenerative myocardial lesion, p. 41.

(c) Hypertension, p. 27.

6. Mild toxemia may clear up under cardiac treatment if the heart is at fault.

Alkaline diuretics may be of use.

Methods advised for uremia may be used if toxemia be severe.

PASSIVE CONGESTION OF THE KIDNEY.

The treatment is that of the cause of the stasis.

UREMIA.

Note. — Uremia is an intoxication of unknown nature, common in severe acute nephritis and in chronic nephritis, and particularly so in exacerbations of the subacute stage of chronic nephritis.

Symptoms vary much in degree. There may be mental sluggishness, drowsiness or coma, loss of appetite, nausea or vomiting, muscular twitchings or convulsions, headache, delirium, disturbance of vision, transient ocular paralysis, paresis of the extremities or paroxysmal dyspnoea. The urine is usually scanty or suppressed. Retinitis and Cheyne-Stokes respiration are common. The onset may be gradual, and with slight signs, or relatively acute and severe. Edema may be present or absent.

Methods of Treatment.

For mild uremia:

1. Diet as for mild acute nephritis.
2. Eliminative measures.
 - (a) Purgation.
 - (b) Sweating.*
 - (c) Water if there is little or no edema.
 - (d) Saline diuretics.
3. Cardiac stimulation is essential if there is any insufficiency.

Severe uremia:

1. Diet should be much restricted in quantity and quality as for severe acute nephritis. Vomiting or unconsciousness may prevent feeding for a time.
2. Water should be administered freely unless there be much edema. If water cannot be taken by mouth it can be used as salt-solution by:
 - (1) Hypodermoclysis.
 - (2) Intravenously.
 - (3) By rectum, (a) Enema.
(b) Seepage.

* Sweating is said to do harm in some cases. I believe, however, that it generally does good in some way not yet understood.

3. **Purgation.** Magnesium sulphate, or other purgatives (p. 201) may be used. Croton oil is useful especially for unconscious patients. If rubbed up with a little butter, made into a ball and placed on the back of the tongue, it will be swallowed. Repeated doses of purgatives should be employed, if needed, to obtain prompt and profuse watery catharsis, but when there is no edema, excessive purgation may tend to concentrate toxins, and may thus do harm, unless counteracted by free administration of water.

4. **Sweating** seems to do good. Hot-air baths may be used daily if they cause profuse sweating. They should not be ordered for an unconscious patient. Pilocarpine should not be used if there is pulmonary edema, cardiac insufficiency or unconsciousness.

5. **Venesection.** A pint or more of blood may be withdrawn from a vein at the elbow by incision, or, if a suitable apparatus be at hand, by aspiration.

Opinion is divided as to the need or value of injecting salt solution after bleeding. Ordinarily, patients do well without it.

6. **Colon irrigations** with large quantities of hot water may be tried in the hope of promoting elimination of toxins.

7. **Drugs.** The use of nitroglycerin or other vaso-dilators is followed frequently by pronounced diuresis in patients having hypertension. The effect is transient.

Morphine may be given subcutaneously for convulsions.

Saline diuretics, *e.g.* "Cream of tartar water,"* Pot. citrate, or "Basham's mixture," may be of use when the severe symptoms have subsided.

Heart stimulants are required when there is any cardiac insufficiency, p. 13.

* A sat. sol. of Pot. bitartrate, the strength of which is 1 in 201, equal to about 40 gra. in a pint, or to 3 gm. in 500 c.c. of water. Lemon juice or lemon peel can be used for flavoring.

CHAPTER III.

ACUTE INFECTIOUS DISEASES.

PRINCIPLES OF TREATMENT.

1. Rest in bed $\left\{ \begin{array}{l} a. \text{ To conserve strength.} \\ b. \text{ To reduce metabolic waste.} \end{array} \right.$
2. Ingestion of much water $\left\{ \begin{array}{l} a. \text{ To dilute toxins.} \\ b. \text{ To favor their elimination.} \end{array} \right.$
5. Bowels should be kept clear $\left\{ \begin{array}{l} a. \text{ To favor digestion.} \\ b. \text{ To prevent absorption of} \\ \text{toxic substances.} \end{array} \right.$
6. Good nursing $\left\{ \begin{array}{l} a. \text{ To secure cleanliness.} \\ b. \text{ To conserve strength.} \\ c. \text{ To promote comfort.} \\ d. \text{ To afford accurate information to} \\ \text{physician.} \\ e. \text{ To facilitate treatment.} \end{array} \right.$
5. Diet should be $\left\{ \begin{array}{l} a. \text{ Easy to swallow.} \\ b. \text{ Easily digestible.} \\ c. \text{ Nutritious but not bulky.} \\ d. \text{ Palatable and varied.} \end{array} \right.$
6. Meals should be $\left\{ \begin{array}{l} a. \text{ Frequent and small to favor diges-} \\ \text{tion.} \\ b. \text{ Commensurate in quantity with} \\ \text{digestive power.} \end{array} \right.$
7. The sick-room should be well ventilated.
8. Infection of others must be prevented.
9. Symptoms should be treated as they arise with regard to the circumstances of the case.

TYPHOID FEVER.

Notes. — Typhoid is characterized pathologically by peculiar ulceration of the small intestines. Ulceration is less frequent in the colon and is rare in the rectum.

Typhoid bacilli enter the blood, the organs, the secretions, and the excretions.

The disease is self-limited, lasting from two weeks to three months. Relapses are common and complications frequent. Toxemia is often severe.

COMMON CAUSES OF DEATH.

1. Toxemia.
2. Exhaustion.
3. Severe complications.
 - (a). Perforative peritonitis.
 - (b) Repeated hemorrhages.

PRINCIPLES OF TREATMENT FOR TYPHOID.

- A. Prevent infection of others.
- B. Dilute toxins and favor their elimination.
- C. Conserve strength of the patient.
- D. Diet should be suited to the individual as well as to the disease.
- E. Drugs are to be prescribed for definite reasons only and not to reduce the fever.
- F. Observe the patient's condition closely and modify treatment promptly when indicated.
- G. Have the best nursing available and if possible have a day-nurse and a night-nurse.
- H. Treat symptoms and complications with due regard to other circumstances of the case.

ROUTINE ORDERS TO NURSE.

1. Enteric precautions.
2. Dr. Shattuck's enteric diet. (Prof. F. C. Shattuck.)
3. Baths as directed every four hours, *p.r.n.*
4. Suds enema every other day or *p.r.n.*
5. Spray throat and wash mouth and eyes every four hours.
6. Hexamethylenamine, 5 grs. (or 0.3 gm.) *t.i.d.*

7. Record temperature, pulse and respiration every four hours, the daily excretion of urine, and the amount of food and water ingested.

Specific directions for diet and baths should be given with due regard for the circumstances of each case. Frequent modification may be required.

METHODS OF TREATMENT FOR TYPHOID.

A. Prophylaxis.

I. Prophylactic inoculation should be required for those coming into intimate contact with the patient (p. 215).

II. "Enteric precautions."

1. Isolation of the patient is desirable.
2. Flies must be excluded.
3. Those who touch the patient should wash their hands promptly.
4. Eating utensils should be reserved exclusively for the patient and washed and kept apart.
5. Sheets and other linen when removed from the sick-room should be soaked in 5 per cent carbolic acid for at least half an hour, or boiled.
6. The best method of dealing with fæces * is that of Kaiser. "It consists of adding enough hot water to cover the stool in the receptacle and then adding about $\frac{1}{4}$ of the entire bulk of quicklime (calcium oxide), covering the receptacle and allowing it to stand for two hours."

Urine can be treated similarly by adding enough quicklime to bring it to a boil.

7. Bath water may be boiled after using when practicable, but this is not worth while where plumbing is good.
8. Cleanliness of the attendant is essential.

B. Dilution and Elimination of Toxins.

1. The urinary output should be kept above 60 oz. in 24 hours by free administration of water. A much larger quantity of urine can be obtained but it is a question whether water taken in very large quantities may not favor hemorrhage. Liquids, including liquid foods, should total about three quarts daily.

* H. Linenthal: Monthly Bul. Mass. State Board of Health, Jan., 1914.



2. The bowels should be kept clear. If they do not move freely suds enemata may be employed as often as necessary. Cathartics are to be avoided as a rule during the ulcerative stage because excessive peristalsis may favor hemorrhage or perforation.

C. Conservation of Strength. Very important because of the long average duration of typhoid.

1. The nurse should feed the patient, turn him over, allow him to do nothing for himself and should make him comfortable.

2. The maximum of nutrition should be maintained by frequent feedings.

3. Visitors should be excluded entirely as a rule.

D. Diet.

Dr. Shattuck's principle in choosing a diet has been stated by him as follows: "Feed with reference to digestive power rather than name of disease, avoiding such articles of diet as might irritate ulcerated surfaces."

Requirements:

1. Nutritious but not bulky.
2. Easily digestible.
3. Non-irritating to intestine.
4. Quantity commensurate to digestive power.
5. Adapted to the patient's condition.
6. Palatable and varied.

Meals should be frequent, at least once in four hours. If the patient can take little at a time he should be fed every two hours or even every hour.

Diet List. An enteric diet may include the following foods and any others that conform to the requirements stated above: liquid foods, strained cereals, custard, blancmange, junket, simple ice cream, soaked toast without the crust, bread or crackers in milk, soft eggs, oysters without the heel, finely minced chicken, etc.

Coleman has shown that, by the free use of milk-sugar and of cream, loss of weight in typhoid may sometimes be prevented. The cream can be added to milk or to other foods. Milk-sugar can be added to liquids, in the proportion of $\frac{1}{2}$ oz. in 4 oz. (or 15 c.c. in 120 c.c.) of liquid. Coleman's diet, if used indiscriminately, may perhaps cause death.

Departure from routine diet may be required for various reasons, *e.g.*

1. Patient too weak to swallow solid food.
2. Vomiting.
3. Persistent diarrhoea, often due to milk.
4. Severe distension, often due to milk.

Advantages of a liberal diet.

1. Weight and strength are better maintained.
2. Toxemia is less.
3. Distension is uncommon.
4. Convalescence is shorter.
5. Patients suffer less.

E. Medication. Hexamethylenamine (p. 205) should be prescribed by routine as a urinary antiseptic. It may, rarely, cause hematuria or painful micturition. It should then be omitted for a few days and resumed in smaller dosage.

Other drugs may be ordered occasionally for special symptoms as required.

Antipyretics should not be prescribed to reduce fever, but they may be used for headache, in the early stages of typhoid. Being depressants they are dangerous when the circulation is impaired.

F. Observation.

I. Examine the patient once or more daily during the febrile stage.

Look for:

1. Signs of circulatory weakness.
2. Pulmonary hypostasis.
3. Bed sores.
4. Changes in the condition of the abdomen.
 - (a) Distension of abdomen.
 - (b) Spasm.
 - (c) Tenderness.
 - (d) Distension of bladder from retention.

II. Keep track of:

1. Urinary excretion.
2. Nourishment.
3. Account for changes in pulse or temperature. They may be the first sign of hemorrhage or perforation.
4. Keep sterile salt-solution ready for use by hypodermoclysis or intravenously in case of need.

III. It is the duty of the physician carefully to supervise treatment during the period when hemorrhage or perforation may occur, and he himself or his assistant should be accessible at times when emergencies may arise.

G. Convalescence. In convalescence free evacuation of the bowels is important.

Massage may hasten return of strength.

H. Nursing.

The nurse's general duties are to do her utmost to spare the patient exertion, discomfort and mental unrest; to report to the physician at his visit all changes in the condition of the patient; to be prepared to answer questions as to the effect of treatment prescribed; and to notify the physician at once of alarming symptoms or signs suggesting severe hemorrhage or perforation. She should know the possible significance of sudden changes in pulse rate and temperature and should look for blood in every fecal dejection. To prevent accident she should, as far as possible, avoid leaving the patient alone even when he is not apparently delirious.

The following complications can generally be prevented by an experienced nurse: —

- | | |
|--------------------------|---------------------------|
| 1. Bed sores. | 5. Boils. |
| 2. Corneal ulceration. | 6. Cracked lips. |
| 3. Middle-ear infection. | 7. Tender toes. |
| 4. Parotitis. | 8. Hypostatic congestion. |

1. To prevent bed sores: —

- (a) Keep sheets smooth, clean and dry.
- (b) After soiling, clean the skin promptly, dry it, rub in zinc oxide ointment, and powder with starch.

- (c) Change the patient's position occasionally.
- (d) Do not allow prolonged pressure on bony prominences.
- (e) If a red spot appears where there has been pressure keep pressure off that part by rings or pads and paint the spot with picric acid, 1 per cent.

2. To prevent corneal ulceration keep cornea clean by bathing the eyes every four hours with a 2 per cent watery solution of boric acid.

3. Boils in crops are generally due to the use of dirty sponges. If a boil appears care must be taken to avoid spreading the infection.

4. Cracked lips can be prevented by the use of cold cream.

5. Middle-ear infection or parotitis may result from improper care of the mouth. The mouth should be cleaned and the throat sprayed every four hours with a non-irritating antiseptic. Dobell's solution, or "alkaline antiseptic" will serve, diluted, if necessary, with one or two parts of water to avoid irritation of the mucous membranes. Excessive dryness of the tongue from mouth breathing can be prevented by the use of vaseline.

6. Hypostatic congestion of the bases of the lungs is due in part to protracted lying in one position. It can be combated, if not prevented, by rolling the patient on one side and supporting him in this position for an hour or more by means of a pillow. The patient should then be rolled onto the other side for another period of time, and these manœuvres should be practiced at least once daily.

SYMPTOMATIC TREATMENT FOR TYPHOID.

Fever and Toxemia.

Hydrotherapy generally acts well.

Benefits expected from it are:

- 1. Fall of temperature of from 1 to 2 degrees.
- 2. Fall in rate with increase of force and volume of the pulse.
- 3. Deeper breathing and diminution of pulmonary hypostasis.
- 4. Better sleep.
- 5. Diminution of symptoms of toxemia.

Rules for use of baths:

1. Baths should be ordered for definite indications only.
2. For children and for thin and feeble patients, baths should be warmer and shorter than for the robust adult.
3. The physician should supervise the first bath and prescribe subsequent baths with regard to the effect of the first one.
4. If the pulse gets weaker the bath should be stopped.
5. Much cyanosis or shivering after the bath indicates that it was too cold, or too long, or that not enough friction was used.
6. Stimulants are seldom required before or after a bath that is suited to the case and well given.
7. Baths must be modified or omitted if they greatly excite the patient, interfere with sleep, or cause a rise of temperature.

Routine bath order. For temperature * of 103.5 degrees rectal give bath every four hours at 85°. For every half degree of temperature above 103.5° lower temperature of bath-water 5°.

Methods of bathing:

“M. G. H. Typhoid Bath.” With rubber sheet, supported at edges by rolls of blanket make tub in bed of patient. Dash water over him, and rub vigorously in turn, with the hands, the chest, limbs, and back, but not the abdomen. The duration of the bath should be 20 minutes or less if so ordered.

Sponge baths often act well and are preferred in many cases. A mixture of equal parts of alcohol and 2 per cent boric acid solution in water at the required temperature can be used for bathing.

CIRCULATORY WEAKNESS.†

I. Cardiac weakness may be caused by various conditions which are difficult to distinguish from one another, *e.g.*,

1. Exhaustion from lack of nourishment.
2. Preëxisting cardiac lesions.
3. Cloudy swelling.
4. Fresh endo-, myo- or pericarditis.
5. Deranged nervous control.

* Temperatures in typhoid are best taken by rectum because these are more reliable than mouth temperatures. The rectal temperature averages about 1° higher than the mouth temperature.

† Chap. I, p. 31, 33.

Symptoms generally develop gradually so that there is plenty of time to prescribe.

Stimulants should be ordered if the pulse becomes weak or irregular or goes above 120. They may act well or not at all, and their use must often be tentative.

Digitalis, caffeine or other drugs may be tried.

Emaciated or septic patients taking little food may do well on alcohol. It seems sometimes to act as a food, and indirectly as a stimulant.

II. Vascular relaxation (p. 33) is suggested when the pulse is weak in proportion to the heart sounds. The condition can generally be recognized if its mode of development has been noticed (p. 33).

The best remedy is a saline infusion. It may cause a rapid fall in the pulse rate and a marked improvement in the pulse. It may be necessary to repeat the infusion after some hours or it may not be required again.

DIARRHŒA.

Severe diarrhœas are dangerous and must be checked.

1. Examine stools to determine if they contain undigested food. If so, omit that kind of food or reduce the amount. Curds from milk may be found.

2. Tincture of opium or Paregoric generally acts well.

CONSTIPATION.

Constipation is a frequent cause of fever in convalescence. Calomel or Fl. Ex. of Cascara Sagrada, Castor-oil or "Russian oil" (p. 217) may be given at this stage. Neglect of the bowels may result in fecal impaction.

DISTENSION.

1. If stools show curds reduce or omit milk.

2. Turpentine stupes* may give relief and can be used *p.r.n.*

3. Rectal tube may be tried.

VOMITING.

Reduction or modification of diet is advisable for a time at least. Swallowing small pieces of cracked ice, or a teaspoonful of shaved ice with brandy may relieve.

* See textbook on nursing.

HEADACHE.

If not relieved by an ice-cap placed on the forehead, phenacetin fr. 5 to 10 grs. (or 0.3 to 0.6 gm.), with caffeine citrate 1 gr. (or 0.065 gm.), or some other analgesic may be prescribed.

COMPLICATIONS OF TYPHOID.

I. HEMORRHAGE FROM THE BOWEL.

Signs. First sign of small hemorrhage is blood in the stool. First sign of large hemorrhage may be a rapid fall in temperature and a rise in the pulse rate.

Treatment. 1. Omit nourishment, water, and baths.

2. Give nothing but cracked ice by mouth for 24°.

3. Give morphine subcutaneously — repeat dose in 15 minutes or half an hour and repeat again at half-hour intervals until the respiration becomes slower. Do not let the respiration fall below 10 per minute. When it has reached 15 or less give morphine in small dosage, if at all, lest poisoning result.

The object of using morphine is to stop peristalsis and to keep the patient quiet until the hemorrhage has ceased.

4. If the patient be exsanguinated raise the foot of the bed to prevent death from syncope but do not stimulate unless there is imminent danger, because increase of blood-pressure may prolong the hemorrhage.

The best circulatory stimulants for this condition are a saline infusion or a direct transfusion of blood.

5. For small hemorrhages narcotization with morphine may not be required.

6. Patients who are very weak or emaciated should be fed in spite of hemorrhage.

II. PERFORATION.

Treatment. — Surgical. Early diagnosis and prompt operation are essential to success. When the condition of the abdomen has been watched closely before the appearance of the symptoms of perforation the diagnosis will be easier. Spontaneous recovery is extremely rare.

RHEUMATIC FEVER.

Note. — The disease, when typical, is characterized by a migratory articular and peri-articular inflammation with pyrexia and leucocytosis. When untreated the inflammation generally lasts about six weeks. Relapses are common and endocarditis is frequent. Pericarditis or myocarditis is seen occasionally.

There is reason to believe that rheumatic fever is a form of infectious arthritis. Perhaps most of the cases are due to a specific organism.

PRINCIPLES OF TREATMENT.

1. Rest in bed.
2. Relieve pain.
3. Dilute and eliminate toxins.
4. Prescribe large quantities of salicylate and of alkali.
5. Prevent recurrence.
6. Watch for cardiac complications.

METHODS.

1. **Relieve pain** by protecting the joints with cotton and bandages or by splints. For psychic effect oil of gaultheria may be rubbed on the skin before bandaging. Fomentations may be useful to relieve pain and a hot tub bath when pain and fever permit gives much relief. If the pain be severe and not controlled by other means use morphine hypodermically until the salicylate has had time to act.

2. **Dilution and elimination** of toxins can be promoted by the free administration of water. Three quarts or more should be ingested in twenty-four hours unless the heart be weak. Cardiac complications may require limitation of liquids.

The bowels should be kept clear. Cathartics may be prescribed as needed.

3. **Food** should be nutritious and as abundant as can be digested because wasting is often rapid and anemia may develop.

4. **Medication.** Sodium salicylate (p. 203) or some other salicyl compound should be prescribed in large dosage. The quantity should be proportional to the degree of pain and acuteness of the inflammation. For severe cases 10 grs. (or 0.65 gm.) may be ordered every hour until the patient is relieved or toxic.

To avoid irritation of the stomach every dose should be given with a full glass of water. Large doses of sodium bicarbonate seem to diminish the toxic effects of salicylates. Twenty grains or more of soda may be ordered with every dose of salicylate. Enough soda should be taken to render the urine alkaline.

Salicin is a good substitute for sodium salicylate and seems to cause less gastric disturbance. Aspirin,* or oil of gaultheria, may be tried.

When symptoms have been relieved the dose of the drug can be reduced. It should be continued for a month or more after the patient is apparently well.

When salicylates act well, in from twenty-four to forty-eight hours, a fall of temperature occurs, and with it there comes diminution of joint swelling and marked relief from pain.

The common symptoms of salicylate poisoning are nausea or vomiting, tinnitus, headache and occasionally erythema or delirium. When these occur the drug must be omitted until they subside. It may then be resumed in smaller dosage or in different form.

5. Recurrence of arthritis is common early or late.

Early recurrence can generally be avoided by keeping the patient in bed for a week after the inflammation has entirely subsided and by continuing the use of sodium salicylate, fr. 30 to 40 grs. (or 2 to 3 gm.) daily, for one month or more after convalescence. Exercise should be resumed gradually.

Late recurrence and future cardiac disease can often be prevented by eliminating all foci of suppuration. Inflammation of the tonsils or genital tract, sinus infection and pyorrhœa alveolaris should be looked for. Tonsillectomy may reveal deep suppuration not demonstrable externally. Tonsillectomy † should be insisted on if the tonsils are a likely source for future infection. Pyorrhœa can be benefited by rubbing the gums daily with a solution of potassium permanganate and by rinsing or sponging the mouth frequently with hydrogen peroxide (p. 187).

6. Cardiac complications may be latent or severe. Circulatory weakness may require limitation of liquids.

The patient should remain flat in bed for weeks or months after the disappearance of all signs of active cardiac infection,

* Incompatible with alkalis. (N.N.R.)

† Dangerous while the tonsils are acutely inflamed.

and should avoid exertion of all kinds for several months thereafter to give the heart ample time to hypertrophy or to adjust itself to the changes.

There is reason to believe that salicylates taken in large quantity tend to ward off endocarditis.

For further information on endocarditis, see Chapter I, page 21.

ACUTE INFECTIONS MOST COMMON IN CHILDHOOD.

BY EDWIN H. PLACE, M.D.

SCARLET FEVER.

I. Prophylaxis.

A. Immunity.

1. **Natural.** Increases much after 8 years of age and marked after 21 years, considerable below one year of age and lowest from 2 to 6 years of age.

2. **Active.** Claimed by Gabritschusky by means of vaccines of streptococci obtained from scarlet fever cases. Three injections, at intervals of 4 days, of doses of from one to ten millions may be used. Value very doubtful.

B. Asepsis. See under diphtheria (p. 111).

C. Isolation — of great value and should be as early as possible. Finding of missed cases in family or neighborhood or school often possible by investigation at the time of the first recognized case. Isolation should be carried on for four weeks and until there are no abnormal discharges.

1. **Technique.** Technique of isolation is that of surgical asepsis reversed, *i.e.*, to keep infection in a small zone instead of a small area free from infection. Air currents play no practical part in spreading the disease.

a Avoid infecting clothing or utensils from careless touching of patients or putting infected hand or things into pockets, etc. Wear gowns.

b Wash hands thoroughly on leaving zone of infection. Do not handle face or uninfected objects until hands are thoroughly cleansed. Be careful of door knobs.

- c* Boil dishes, utensils, etc., as they leave patient. Do not put down infected dishes, etc., in an uninfected zone.
- d* Boil clothes or soak them in 5 per cent phenol solution or similar germicidal solution. Be careful not to infect surroundings in removing these objects from the infected zone.
- e* Use care to prevent discharges from nose, throat, ear, etc., from being spread about sick room. Use soft piece of paper, towel or cloth and deposit at once in paper bags or burn.
- f* Do not allow infected objects as thermometer, pencils, stethoscope, books, money, etc., to be taken from infected zone without proper disinfection.
- g* Thorough cleansing of patient when released from infected zone, — while of questionable importance, — still must be done. The mouth should be thoroughly cleansed and antiseptic sprays may be used in the nose, although value is uncertain. Patients should not be released until all signs of inflammation of mucous membranes have entirely subsided.

D. Quarantine. Exposed persons should not be allowed to go to new places or come in contact with other children as in school or social assembly, etc., until 2 weeks after the last exposure. Care should be taken to see that they have not a mild and overlooked infection. Closing of school is unnecessary provided careful study of the children is made to eliminate those who are ill or who are carriers.

E. Disinfection — of doubtful value as a general measure of control. Proper cleanliness and asepsis about patient obviates this necessity. In well-lighted and aired rooms, objects that might have been infected have usually ceased to be a source of danger by the time the patient has ceased to harbor the organisms and can be released. Disinfection can be done by exposure to sun, by thorough cleansing and washing with soap and water and germicidal solutions such as phenol or corrosive sublimate or by thorough and prolonged exposure to formaldehyde gas.

II. Treatment.

The great dangers of scarlet fever are sepsis, cardiac involve-

ment, nephritis and toxæmia. Of these sepsis is by far the greatest factor in mortality.

A. Toxæmia, treatment of:—

1. **Serum treatment.** Convalescent patient's blood 50 to 100 cc. should be used intravenously preferably. Testing for syphilis and bacterial contamination should be done before using serum; this treatment of limited application but has some value.

Antistreptococcus serum obtained from horses. Moser's serum, obtained by injecting horses with many strains of streptococci cultivated from scarlet fever patients, may be used in doses of at least 200 cc. It is of little value in some cases and often disappointing.

2. **Free fluid intake.** 1½ litres daily according to age. If patients do not take fluid freely it may be given by rectum or subcutaneously or in very toxic cases intravenously as salt solution.

3. **Eliminative treatment.** Mild catharsis. Daily warm bath, etc.

4. **Rest in bed.**

B. General Sepsis, treatment of:—

1. **Prevention.**

a **Guarding portals of entry.**

- (1) **Local cleansing of mouth, gums, teeth, etc.,** with cotton swab applicator 2 or 3 times daily. Saline solution, soda bicarb. solution, borax solution or a combination of these with 10 or 20 per cent glycerine or other mild cleansing solution may be used such as Dobell's.
- (2) **Protection of mucous membranes from trauma, etc.** Alboline and similar petroleum oils are of value following cleansing of mouth, especially in mouth breathers, and where there is mucous membrane infection. Carious teeth, old roots, tartar deposits, etc., should be seen to.
- (3) **Antiseptics.** Phenol, eucalyptus, argyrol, silver nitrate, iodine, etc., are of doubtful value. Their use may cause chemical injuries to mucous membrane. They should be used in dilution too weak to cause irritation.
- (4) **Nasal infection.** Nasal infection and nasal vault infection as well as accessory sinus disease may be a

sources of danger but are difficult to treat effectually. Mechanical cleansing by swabs is allowable. Syringing is liable to cause injury, or spread infection. Patient may clear the nose by blowing, if old enough; application of ointment and medicated oils for protection and mild antiseptic action is of value.

- (5) Burns, wounds, blisters, etc., of the skin should be treated aseptically and antiseptically in all cases.
- (6) Tonsilectomy. Removal of tonsils and adenoids as early as possible in the acute stage of infection has been suggested and, in practice, seems to be beneficial.

b General Hygiene.

2. Treatment. Same as prevention. Rest in bed, free fluids, sunshine, fresh air, outdoor treatment. Secure sleep and comfort by alleviating cause of discomfort by any means available. Sleep and rest should not be sacrificed to the use of antiseptics, etc. Supply energy by easily assimilated foods. Sugar is of great value.

C. Local Sepsis, treatment of:—

1. Throat. Antiseptics of questionable value. Cleanliness and soothing treatment is principle. Swabbing local lesions carefully with one-half strength hydrogen peroxide, 20 per cent argyrol, iodine preparation, 5 to 50 per cent silver nitrate, or 2 to 4 per cent chromic acid solutions selectively used may be of benefit. Hot irrigations often help. Coughing and struggling when irrigations are given contraindicates their use.

2. Nose. Cleansing of nose by the patient blowing is better and safer than irrigations. Sprays are of little value but may be used.

Instillations of 15 per cent argyrol, or camphor, gr. v, menthol, gr. v, and iodine, gr. i, in alboline, 1 oz. may be tried.

Insufflations of calomel powder twice daily are often of value.

3. Otitis Media.

a Prevention.

- (1) Avoid nasal irrigation, palpation of nasal vault for adenoids, coughing, forcible washing of throat, Trendelenberg's position, etc.

(2) Prevent obstruction of nose from acute swelling — by oily instillations or sprays as above. Adrenalin 1 to 8000 in oily preparations (adrenalin inhalant) may sometimes help. Ten drops of 15 per cent argyrol may be instilled into the nostril and allowed to run down into the fossa of Rosenmüller by holding head to that side while in the supine position for 20 minutes.

Note. — Previous abnormalities of nasal vault, such as adenoids, large turbinates, etc., as well as attempts at local asepsis are important factors in causing otitis.

b Treatment.

(1) Treatment of nose and nasal pharynx as above.

(2) Free drainage by cutting drum if bulging. Repeat it as often as necessary.

(3) Irrigations ev. 2 to 4 hours with boric acid or saline solution at 100 to 110 degrees Fahrenheit.

(4) The dry treatment may be used instead of irrigations especially when discharge is thin. It consists of frequent sponging out with sterile cotton and keeping in a narrow wick to the drum but not closely filling the canal. To this may be added boric powder insufflations or instillations of 5 per cent boric acid in 15 per cent alcohol solution. Silver salts and other antiseptics are of questionable value.

(5) Watch for symptoms of mastoiditis.

4. Mastoiditis.

a Prevention. Watch and promptly treat otitis media.

b Treatment.

(1) Prompt drainage of middle ear by paracentesis. Repeat as often as necessary. Copious irrigations every 2 hours — hot. Applications of ice to the mastoid process.

(2) Operation is indicated if tenderness persists, if oedema increases or if temperature remains up for more than 3 days.

5. Cervical Adenitis.

a Prevention.

(1) Throat and mouth cleanliness, attention to teeth, gums, etc.

(2) Removal of tonsils and adenoids. Even in an acute stage of the disease removal of the tonsils has given highly favorable results, but further experience is desirable.

(3) Treatment of diseases of the nose and accessory sinuses.



b Treatment.

(1) Ice applications the first few days; poultices afterward. Resolution without pus often occurs with poultices.

(2) Treat throat, mouth and nose as needed.

(3) Chemical applications as methyl salicylate, iodine petrogen, ointment of colloidal silver (Credé) are of very doubtful value but may be used.

(4) Incision if suppuration occurs. Best results obtained by not incising too early, allowing pus to become localized and the induration to subside. Burrowing of pus is rare. If it occurs incise very promptly. Incision should be as short as possible and in lines of cleavage of the skin to avoid scar.

6. Pyaemia.

Incisions and drainage as lesions develop.

7. Arthritis.

(a) **Simple.** (Scarlatinal arthritis and peri-arthritis.) Self-limited in a few days. Rest. Immobilization by cotton batting bandages or splints. Applications of methyl salicylate dressings, etc.

(b) **Septic.** Incision as early as diagnosis has been made. Thorough and prolonged washing out of cavity and sewing up tight has given the best result. Incision followed by rubber dam drains has not been so favorable. Immobilization.

8. **Phlebitis** (rare). Elevation for circulation. Local heat such as poultices. Citric acid internally may be used.

9. **Arterial Thrombosis** (rare). Elevation, local heat, amputation only after line of demarkation has formed.

10. **Empyema.** Drainage by operation.

11. **Peritonitis** (rare). Operation required.

12. Local infections can then be benefited by autogenous vaccines.

D. Nephritis.

I. Prevention.

a **Attempt to reduce toxæmia of acute stage.** See under toxæmia.

b Kidney rest.

(1) Rest in bed for at least three weeks in all cases.

(2) Avoid excessive loss of heat and all chilling of skin.

(3) Free fluid intake in the absence of œdema probably benefits the kidney.

(4) **Diet.** Low protein, chiefly carbohydrate and fat. Avoid extractives, nucleo-proteids and foods rich in purin. Cream and milk, one to two pints, cereals, especially wheat, rice, baked potatoes, tapioca, sugar, sweet fruits, bread, green vegetables, except asparagus. In the acute stage patient may refuse everything but fluids. Sugar may be used at this time freely.

(5) Daily hot bath.

(6) Salt intake may be reduced but value is uncertain. Alkalis may be given.

1. **Treatment.** See Nephritis, page 49.

2. **Uraemia.** See page 59.

E. Cardiac complications.

1. **Endocarditis.**

a Prevention.

(1) Avoid and promptly treat local infection as alveolar abscess, otitis media, septic joints, diseased tonsils, accessory sinus disease and other focal infections, which may be responsible for infection.

(2) Prevent exertion during the period likely to be attended by cardiac complications.

(3) Reduce Toxæmia.

b Treatment.

(1) Rest to be as complete as possible, prolonged until lesion has entirely healed — 2 to 6 mos. Cardiac stimulants are contraindicated because cardiac insufficiency does not develop early. An ice-bag, aconite, or bryonia may perhaps give the heart relative rest by quieting its action.

(2) **Salicylates.** Danger of kidney injury must be kept in mind.

2. **Pericarditis.** The same as endocarditis.

Morphine may be necessary because of pain. Posture may need to be upright also for this reason. Fluid may require aspiration. Pus will require operation and drainage.

F. Fever. Usually self-limited, not prolonged. Alcohol rubs, cold sponges, cold baths, may be used for a stimulant effect. Friction of the skin is usually advisable while using cold treatment. Friction alone using cocoa butter may also reduce temperature, stimulate vaso-motors and add to comfort.

MEASLES.

I. Prophylaxis.

A. Immunity. Practically none.

B. Asepsis. Particularly difficult in general life because of droplet infection. The most casual contact will allow the disease to be contracted. Avoid the region of persons who sneeze. Keep hands clean and avoid touching mouth or nose with infected hands or infected objects.

C. Isolation — of little general value because of the contagiousness of the disease, and the appearance of contagiousness usually several days before the disease is recognized. Isolation to be of any value should be secured early in the catarrhal stage, and continued until the acute catarrhal stage has subsided, that is, from seven to fifteen days.

Technique. Patient must be isolated so that droplet infection may not be carried to others, otherwise technique same as for scarlet fever except of much less importance.

D. Quarantine. The one effective means of control. Patients exposed should be kept from contact with non-immunes until three weeks from the last exposure. The disease cannot be stopped in schools by inspection and requires closing of the schools if it is desired to check the epidemic. Closing of the schools to be of value requires prevention of continued contact of the families of a community.

E. Disinfection — of practically no general value. Measles contagion dies with extreme rapidity and probably invariably within 24 hours under ordinary conditions. Surroundings of patients who have recovered have ceased to be infected.

II. Treatment.

The chief cause of death is secondary infection of mucous membranes of which pneumonia is of greatest importance. Treatment, therefore, should be directed against mucous membrane infection, especially of the lungs.

A. Acute toxæmia.

1. Free fluid intake.
2. Cathartics must be used carefully to avoid causing diarrhoea.
3. Stimulation.
 - a Tepid baths or cool sponging.
 - b Friction to skin, as cocoa butter rubs, etc.

B. Mucous membrane infections.**1. Bronchopneumonia.****a Prevention.**

- (1) General resistance. Fresh air, sunshine, rest in bed, and food easy to digest and to absorb help to maintain resistance.
- (2) Local resistance. Mouth cleanliness, prevention of nasal and laryngeal obstruction, soothing oily sprays may do good.
- (3) Avoidance of other infections as colds, diphtheria, etc.

b Treatment. See pneumonia, page 121.**2. Acute laryngitis.**

- a** Expectorants of which water is the most essential, syrup ipecac, syrup hydriodic acid, etc.
- b** Steam inhalations with compound tincture of benzoin and menthol, followed by oily sprays.
- c** Intubation if obstruction occurs and requires it.
- d** Antitoxin in all cases unless diphtheria has been excluded by examination of the larynx and taking cultures from the larynx.

3. Tracheitis. Same as laryngitis.**4. Otitis Media.** See scarlet fever.**5. Rhinitis.**

- a** Soothing applications, oily sprays.
- b** Atropine, camphor, etc., as in rhinitis tablets.

6. Stomatitis.

- a** Mouth cleanliness.
- b** Hydrogen peroxide if teeth and gums are foul — use once or twice daily.
- c** Chromic acid solution, 2 to 4 per cent: apply with swab once daily.
- d** Removal of carious roots, bad teeth, etc.
- e** Careful avoidance of trauma of any kind. Mouth cleanliness, mild antiseptic solution with cotton swab applicators.

Iodine preparations and silver nitrate may have value in certain selected conditions.

7. Noma.

- a Prevention.** Careful attention to mucous membranes

of the mouth prevents stomatitis. Avoid trauma by teeth or manipulations. Treat all ulcers promptly with peroxide and apply chromic acid solution.

- b* Treatment. Escharotic to destroy completely the infected area; the actual cautery is the best, with chloroform anæsthesia.

8. Conjunctivitis.

- a* Boric acid solution wash three times daily.
- b* White vaseline for lids.
- c* Avoid injuring cornea.

9. Entero-colitis.

- a* Prevention. Avoid overfeeding; be sure that milk and other food is free from contamination or is pasteurized or sterilized. Avoid unwise catharsis. Avoid starvation.
- b* Treatment. Force fluid, cereal diet, bismuth in drachm doses every four hours. Beta-naphthol may be tried.

PERTUSSIS.

I. Prophylaxis.

A. Immunity.

- 1. Natural. Extremely low in early life, becomes greater after five years and considerable in adult life.
- 2. Active immunity is claimed by means of vaccine. Value is uncertain.

B. Asepsis. Similar to that of measles, p. 101.

C. Isolation. Similar to that of measles, p. 101.

D. Quarantine. Similar to that of measles, p. 101.

E. Disinfection. Similar to that of measles, p. 101.

II. Treatment.

A. Vaccines still remain of doubtful value, but are worthy of trial. Vaccines containing many strains of the Bordet-Gengou bacillus should be used — dosage of from 100 million to a 1000 million may be used at intervals of from two to five days.

B. Hygienic.

1. Building up general resistance. Fresh air and sunshine. Rest, varying with the amount of prostration or fever.

2. Diet. Easily digested foods such as cereals, milk, bread and butter, rice, simple puddings, chicken, scraped beef, zwiebach,

etc. If vomiting occurs, meals should be frequent and small in amount and given if possible after the paroxysm. If a meal is vomited, it should at once be repeated. High protein foods are inadvisable because of the longer stay in the stomach and the danger of loss from vomiting.

3. Bitter tonics, iron, etc., may be given. Avoid medicines which might upset digestion.

C. Local resistance. Avoid dust, irritant gases, etc. Oily sprays as albolene or albolene with other sedatives or antiseptics to nose, throat and larynx may be used. Free water intake is essential. Inhalations of steam with menthol and creosote are sometimes useful to stop the paroxysm, but must not be used at the expense of general hygienic treatment.

D. Sedatives should be used only when demanded for severe cough which exhausts the patient or interferes with sleep and nourishment. Antipyrin 1 to 4 grs. three times a day, or Quinine Sulph. 2 to 5 grs. may be tried, or Tincture of Belladonna, beginning with 1 to 3 min. ev. 4 hours and increasing until the physiological effect appears and then continuing in slightly smaller doses. Chloral may be used in the dose of 2 to 5 grs. once or twice a day.

E. Paroxysms of cough.

1. Fresh air day and night is, probably, the most efficient means of diminishing cough.

2. Psychic treatment — calm the fear of patient by psychic suggestion and avoid psychic upsets and loud noises.

3. Avoid all irritants.

4. Pressure on the epigastrium or the use of tight bands around the abdomen.

5. Spraying the larynx, with sedative solution such as menthol or by inhalations of steam with benzoin followed by menthol, etc., are of limited value.

6. Sedative drugs: see above.

F. Complications.

1. **Bronchopneumonia.**

A. Prevention.

- (1) Fresh air and sunshine throughout the disease.
- (2) Rest.
- (3) Keep up nutrition by wise feeding.
- (4) Avoid fatigue from paroxysms.

- (5) Avoid other infections, such as acute colds, irritants, such as dust, etc.
2. **Stomatitis.** See Measles, page 103.
3. **Otitis Media.** See Scarlet Fever, page 93.
4. **Cerebral hemorrhages** may be guarded against by attempting to control severe paroxysms of cough.
5. **Vomiting.** Prevention depends on control of cough. The danger is malnutrition. The effects can be minimized by frequent small meals, and by taking food promptly after vomiting.

VARICELLA.

I. Prophylaxis.

A. Immunity. Considerable under six months and increased distinctly after five years, and is rather marked in adult life.

B. Asepsis. Difficult to carry on in practice, the disease is so contagious. Principles are similar to scarlet fever and diphtheria.

C. Isolation — should be insisted on as early as possible and continued until complete healing of the lesions or until they are entirely dry.

1. **Technique,** same as for scarlet fever and diphtheria, p. 87.

D. Quarantine. It is important to keep exposed persons from contact with others for three weeks after the last exposure.

E. Disinfection. See Scarlet Fever, p. 89.

II. Treatment. The toxæmia of varicella is of slight importance. Nephritis rarely follows the disease. The chief danger is from infection of the skin lesions with other organisms such as the streptococcus, diphtheria bacillus, etc.

A. Toxæmia. Cold sponging, ice caps, rest in bed, force fluids, during the acute stage of fever.

B. Local lesions. Careful asepsis is essential from the beginning. Daily baths with soap and water preferably by shower, drying the skin with clean towels and anointing with boric acid, vaselin or camphorated oil are of value. Underclothes, night clothes and sheets should be kept scrupulously clean and changed daily. At times it may be advisable to use weak chlorinated baths. Chlorinated soda is especially beneficial for small areas of secondary skin infection and may be followed by application of ammoniated mercurial ointment.

C. Mouth lesions. Occasionally many lesions occur in the mouth which may require very careful asepsis and cleansing.

D. Corneal or conjunctival lesions may occur. Treatment of these lesions should be very prompt and active to avoid blindness.

DIPHTHERIA.

I. Prophylaxis.

A. Immunity. This can be tested by Schick's test. $\frac{1}{10}$ of the minimum lethal dose of diphtheria toxin freshly diluted is injected intracutaneously into arm. A positive reaction at the end of 48 hours shows a red, infiltrated area of 1 cm. or more in size, the central part of which later becomes pigmented and finally desquamates. The whole duration of the lesion is one or more weeks. Persons having a positive reaction have no antitoxic immunity, although they may have other immunity. Those showing no reaction at the end of 48 hours are immune. The immunity usually persists indefinitely. False reactions usually occur early and subside quickly. They may cause an error in reading results.

1. **Passive.** 1000 to 2000 units of antitoxin, subcutaneously. For immediate need; lasts one to three weeks or more.

2. **Active.** Toxin and antitoxin mixtures are used. 70 to 85 per cent of the L + dose of toxin mixed with one unit of antitoxin is injected at intervals of one week for three doses. An immunity slowly appears that lasts months or years.

3. **Local.** Secure good local conditions of mucous membrane. Remove bad teeth or roots, diseased tonsils and adenoids, etc. Treat diseased gums and mucuous membranes and avoid mechanical or chemical injuries to the mucous membranes.

B. Asepsis.

1. Avoid putting fingers, pencils, pins, etc., in the mouth or to the nose.

2. Wash the hands carefully before eating.

3. Do not use common drinking cup or common towel, etc.

4. Avoid kissing on lips.

5. Avoid region of people who cough, sneeze or spit.,

6. Avoid milk handled or produced under poor conditions, or by ill persons, and avoid public dining rooms poorly managed.

C. Isolation. Isolation is of great value. Prompt recognition is required to make this effective. Missed cases also must be found by epidemiological studies, and culturing suspects. Isolation should be continued until virulent diphtheria bacilli have been absent as shown by cultures for at least three days.

1. Technique of isolation. See under Scarlet Fever, p. 87.

D. Quarantine. Quarantine is of little practical value as cultures may be taken in exposed persons, and if found to be negative, quarantine need not be continued. Closing of schools or other places of assembly is unnecessary, but measures should be taken to discover carriers as well as clinical cases among those who thus come together. Schick's test is of great value in finding those who are susceptible to the disease.

II. Treatment.

The chief causes of death in diphtheria are the result of diphtheria toxin acting on the nervous centers or upon the heart or peripheral nerves and to a less extent of mechanical strangulation and pneumonia, as in the laryngeal cases. The essential, is, therefore, prompt treatment of diphtheria toxæmia and mechanical obstruction to breathing.

A. For Toxæmia.

1. Antitoxin.

a As early as possible, first day best.

b Dose, varying with severity of disease and mode of administration. 2000 for very mild to 100,000 units or more for very severe cases. See antitoxin, page 191.

2. General eliminative measures. See principles of treatment, page 63.

B. For obstruction of breathing.

1. Antitoxin as early as possible.

2. Intubation for obstruction at larynx.

(*a*) Indications. Stridor, use of accessory muscles of respiration, restlessness, dyspnoea. Relief should be secured before cyanosis and exhaustion occur.

3. Tracheotomy.

(*a*) If intubation fails.

(*b*) For obstruction above or below the larynx.

4. Bronchoscopy.

(*a*) For membranous obstruction low down in trachea or bronchi.

C. Local treatment. Of slight value or importance.

1. Cleansing irrigations for the throat. Saline solution, boric acid solution, or Dobell's solution may be used copiously for cleansing and soothing mucous membranes and should be used

as warm as patient can tolerate it. Do not exhaust the patient by excessive attention.

2. Bacteriocidal thereby has failed.

3. Soothing applications for mechanical protection of mucous membranes, such as alboline and oily sprays. The nose may be treated in this way or by instillations. Irrigations should not be used in the nose.

D. Rest. In all cases in which toxæmia is marked the patient should be kept in bed for three to six weeks, because cardiac or nerve complications may occur as late as this.

E. Hygiene. Sunshine, fresh air, freedom from dust, etc.

F. Diet. Large amounts of fluid. Balanced diet easily digestible and sufficient for energy requirements. No special dietic indications except digestibility and water content.

III. Treatment of Complications.

1. **Cardiac.** Occurs chiefly in the first three weeks of the disease.

a Prevention. Solely by early antitoxin in sufficient amount.

b Treatment.

(1) Horizontal position. Do not allow the head or body to be raised.

(2) Nothing by mouth if nausea or vomiting is present.

(3) Nutrient enemata and salt solution by rectum as required by thirst.

(4) Morphine subcutaneously in small doses for sedative effect.

(5) Stimulation of doubtful value. Caffeine sodium salicylate grains one to five ev. 4 hours, subcutaneously.

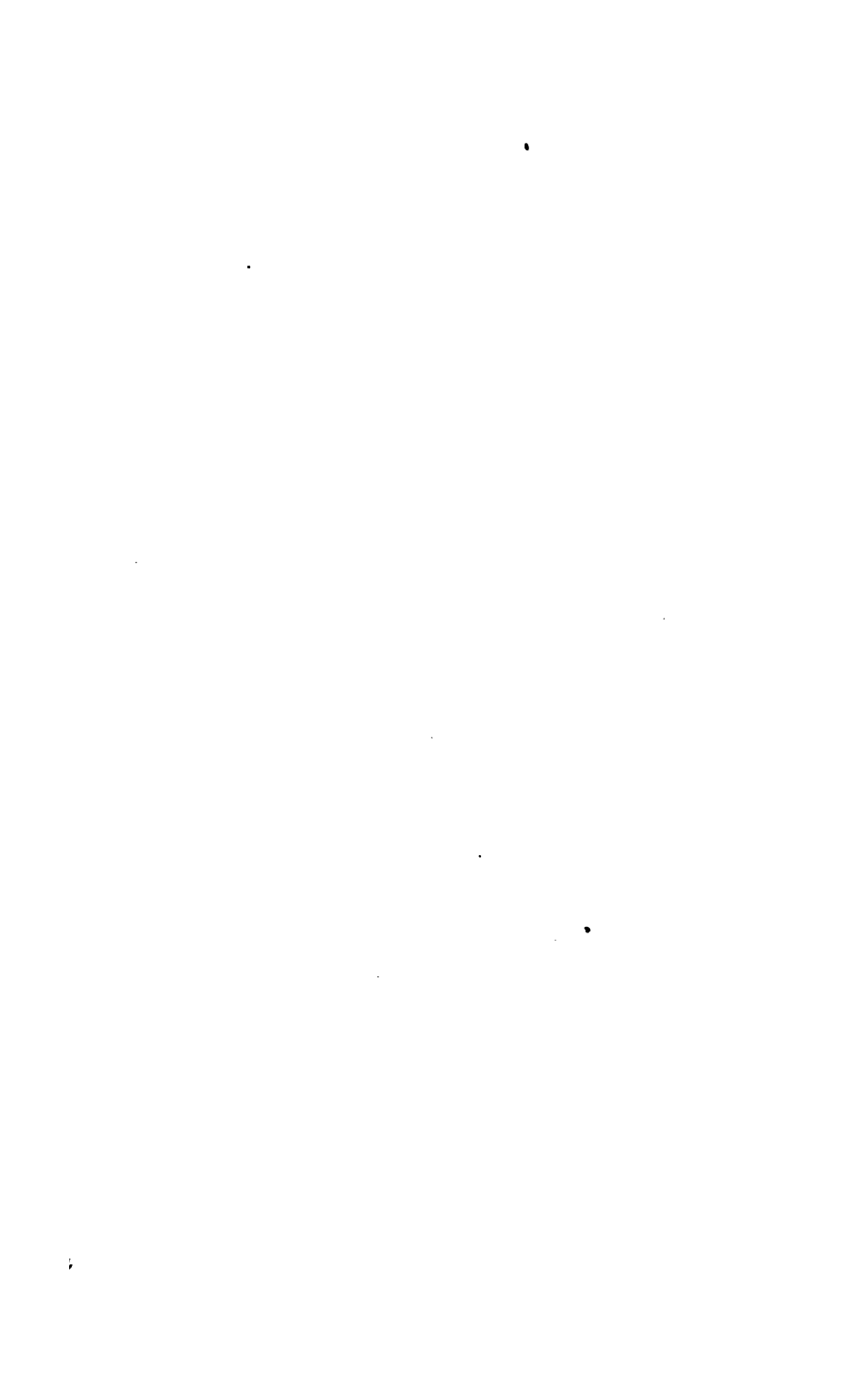
Note.— The essential of treatment is to secure the highest degree of rest and avoidance of strain on the heart. The disturbance is self-limited, rarely lasting more than one week. If the demand on the cardiac function is kept to a minimum for this period, recovery may occur.

2. **Diphtheretic Paralysis.**

(a) Prevention. Solely by early administration of antitoxin in sufficient amounts.

(b) Treatment.

(1) Improve circulation locally by massage, electricity and passive motion.



- (2) Improve general condition. Fresh air, sunshine, food, iron and tonics.
- (3) Antitoxin is of no value after the paralysis appears.
- 3. **Otitis Media.** See under Scarlet Fever, page 93.
- 4. **Pneumonia.** See under Pneumonia, page 121.
- 5. **Chronic "tubes"**; chronic obstruction of larynx after intubation.

a **Prevention.**

- (1) Avoid trauma in operation.
- (2) Correct size tubes to avoid undue pressure.
- (3) Shortest reasonable duration of wearing tube.

b **Treatment.**

- (1) Tracheotomy to avoid laryngeal irritation or injury if obstruction persists four weeks without improvement.
- (2) After healing of larynx mechanical dilatation by means of tubes or dilators.

6. **Cervical Adenitis.** See under Scarlet Fever, p. 95.

7. **Serum Disease.**

a **Urticaria.** Local and general sedatives, and mild cathartics and free fluid intake. Adrenalin 1 to 1000 solution, minims, 10 to 15 subcut. Repeat in 20 minutes if necessary.

b **Angio-neurotic edema.** Treatment unnecessary and ineffective.

c **Erythema multiforme.** No treatment effective.

d **Enlargement of lymph-nodes.** Apply ice.

e **Arthralgia.** Immobilize, gaultheria dressings, salicylates.

f **Arthus' phenomenon,** a local cellulitis at point of injection of antitoxin. Poultices.

g **Vomiting.** Stop everything by mouth for a time.

h **Anaphylactic shock.**

(1) **Prevention.**

(*a*) **Skin test.** Scratch skin and apply a little serum. Local reaction of urticarial type in 2 to 15 minutes shows susceptibility. This case should be given serum only when absolutely essential and under special precautions.

(*b*) If sensitized to horse serum bovine serum may be used, but sensitization to this should also be tested.

- (c) If patient is sensitized, desensitization may be tried.
 - (1) Small doses starting with 1 $\frac{1}{100}$ cc. to 1 $\frac{1}{1000}$ cc., and increase the dose carefully at about $\frac{1}{2}$ hour intervals.
 - (d) Paralyze mechanism of shock, *i.e.*, bronchiole spasm.
 - (1) Atropine in full dose subcutaneously, 1 half hour before serum.
 - (2) Adrenalin in full dose at the same time as serum.
- (2) **Treatment.** Usually death is too rapid to allow of treatment being used.
 - (a) Atropine, full doses.
 - (b) Adrenalin, full doses.
 - (c) Oxygen.
 - (d) Heat.

IV. Carriers.

1. Remove mucous membrane abnormalities, if possible. Enlarged tonsils and adenoids, foreign bodies, accessory sinus disease, carious teeth, etc.

2. Chemical applications have been of very doubtful value — silver nitrate, as well as argyrol, acetic acid, chromic acid, iodine, etc., have been used.

3. "Overriding," by spraying with other bacteria, such as the staphylococcus and bacillus bulgaricus has not proved of definite value.

4. Powdered kaolin applications at short intervals has not proved its value.

5. Vaccine treatment is still of questionable value.

PULMONARY INFECTIONS.

LOBAR PNEUMONIA.

Notes. — An acute infectious disease of multiple etiology, most commonly caused by the pneumococcus. The rate of the pulse and respiration are indices of toxemia.

Mortality commonly due to:

- | | |
|-------------------|--------------------------------|
| 1. Toxemia | { (a) Circulatory disturbance. |
| | { (b) Asphyxia. |
| less often to | { (a) Empyema. |
| 2. Complications. | { (b) Pericarditis. |
| | { (c) Endocarditis. |

PRINCIPLES OF TREATMENT.

1. Secure good nursing and fresh air.
2. Eliminate and dilute toxins.
3. Watch circulation.
4. Stimulate promptly when required.
5. Prescribe drugs only for definite reasons.
6. Take precaution to prevent accident.
7. Diet suitable to case.
8. Recognize complications promptly.

METHODS.

1. Eliminate toxins by requiring copious ingestion of water, unless the heart be weak, and keep the bowels clear. Watch urinary output to see that the water is being excreted.

2. Out-of-door treatment is likely to benefit robust patients, but the old and feeble are likely to do better indoors. Fresh air is, perhaps, the best stimulant in pneumonia. Sometimes it diminishes dyspnoea and promotes comfort.

3. Note the outlines and sounds of the heart and the quality of the pulse at every visit.



4. Stimulation is indicated (a) if the quality of the pulse be poor, (b) if it becomes irregular or (c) if the rate go above 120.

Irregularity early in the illness is less apt to herald danger than that developing late.

5. Morphine is *indicated* to relieve pleuritic pain when a tight swathe fails to do so. Sleep is very important to conserve the strength of the patient and morphine may be used to obtain it, especially in the *early stages* of pneumonia.

Morphine is *contraindicated* whenever bronchial secretion is profuse, because it checks expectoration, and if morphine is to be used in the *later stages* caution is necessary.

6. Diet should consist of food that requires no chewing and that is easily swallowed; *i.e.*, liquids and soft solids.

The amount should be gauged by the digestive power of the individual, but the usual course of the disease is so short that nutrition is seldom important.

7. Avoid renal irritants and gas-producing foods.

Besides the complications above-mentioned look out for a true nephritis.

8. When temperature is very high and the heart doing well, sponge baths may be used to reduce the fever.

9. Tympanites may require treatment. An enema of 1 oz. (or 30 c.c.) of glycerin undiluted generally acts well.

10. Dyspnoea with cyanosis can be relieved to some extent by inhalation of oxygen passed through absolute alcohol.

STIMULATION OF HEART.

On the third or fourth day, 10 m. (or 0.6 c.c.) of Tr. digitalis may be ordered *t.i.d.* It may, perhaps, ward off sudden dilatation of the heart.

For **irregularity or weakness** caffeine sodio-salicylate may be used subcutaneously, and at the same time digitalis can be given by mouth for subsequent effect, or digipuratum solution (p. 197) can be injected instead of caffeine.

For **acute cardiac dilatation** the following remedies may be tried according to circumstances:

Subcutaneously:

1. Digipuratum-solution.

2. Camphor in oil: 3 grs. (or 0.2 gm.). It should be specially prepared for subcut. use.

3. Caffeine sodio-salicylate: 3 grs. (or 0.2 gm.). It may cause irritability or wakefulness.

Intravenously Digipuratum-solution or Strophanthin (p. 197) may be given. The latter is dangerous.

By mouth:

1. Brandy, fr. $\frac{1}{2}$ to 1 oz. (or 15 to 30 c.c.).

2. Aromatic spirits of ammonia, 1 drach. (or 6 c.c.).

Venesection may do good if there is cyanosis with much engorgement of the right ventricle.

Acute pulmonary edema yields occasionally to a large dose of atropine $\frac{1}{8}$ gr. (or 0.001 gm.) given subcutaneously.

Vascular relaxation. The momentary application of cold in the form of an ice-bag to the abdomen may do good by causing reflex vascular contraction. Salt solution subpectorally or intravenously may be beneficial. If improvement results follow it up with caffeine.

DELIRIUM: TREATMENT

Active delirium may be ameliorated by morphine (see sec. 5, p. 123), by hypnotics, or sometimes by hyoscine hydrobromate* used subcut. Alcohol internally may be of service for delirium with exhaustion.

Caution. Delirium, even when slight, may be dangerous. When the nurse leaves the room even for a moment some one should take her place lest the patient jump from the window. No razor or weapon of any kind should be left about.

BRONCHO-PNEUMONIA.

Treatment is essentially the same as for lobar pneumonia except that the disease generally runs a milder, but longer, course. Nutrition, therefore, is more important.

Bronchitis is often associated with broncho-pneumonia and, when this is the case, expectorants may be of service during convalescence.

* Scopolamine is chemically the same as hyoscine. (U.S.D.)

BRONCHITIS.

ETIOLOGY.

Acute bronchitis commonly follows infections of the upper respiratory tract and especially infections by the pneumococcus or influenza bacillus. It occurs symptomatically in some infectious diseases, *e.g.*, typhoid and measles.

Chronic bronchitis is often associated, in old or middle-aged persons, with *slight cardiac insufficiency* or with emphysema. Rarely, gout is a factor.

DIAGNOSIS.

Acute or chronic bronchitis may be simulated by tuberculosis and, therefore, sputum examination is imperative. Many cases of bronchiectasis following influenza are wrongly diagnosed as bronchitis or as phthisis.

ACUTE BRONCHITIS: TREATMENT.

1. When there are constitutional symptoms the patient should keep warm and avoid change of temperature by staying indoors.
2. If there is fever, bed may be advisable or necessary.
3. Bronchial secretion must be expectorated, but unproductive cough should not be allowed to fatigue the patient or to prevent sleep.

If the cough comes from laryngeal irritation (p. 147), lozenges may suffice to check it; if from the larynx or trachea, steam inhalations (p. 147) may be serviceable. If necessary for relief of cough codeine sulphate $\frac{1}{4}$ gr. (or 0.016 gm.) or heroine hydrochloride * $\frac{1}{8}$ gr. (or 0.005 gm.) may be prescribed for use in the afternoon or at night. Morning cough is generally needed to clear the lungs. It can be promoted by a hot drink.

4. Substernal distress or pain, see tracheitis, p. 147.

5. Expectorants are contraindicated during the acute stage of bronchitis because they irritate the inflamed mucous membrane. They may be used during convalescence, at which time the expectoration is often tenacious and difficult to raise.

* The hydrochloride of the diacetic ester of morphine (U.S.D.) not official. "Heroin" is a name bearing U. S. t (N.N.R.).

6. Several weeks are generally required for complete recovery, but when the patient feels well he may be allowed to resume his occupation. Smoking and cold bathing should be resumed cautiously and unnecessary exposure should be avoided as long as expectoration persists.

CHRONIC BRONCHITIS: TREATMENT.*

1. Expectorants are generally beneficial, particularly potassium iodide in the dose of fr. 5 to 10 grs. (or 0.3 to 0.6 gm.), *t.i.d.*

2. When there is any sign of cardiac insufficiency, appropriate stimulants are indicated. For slight insufficiency the Compound Squill Pill may act well both as a heart stimulant and as an expectorant. The usual dose is from 6 to 9 pills daily. They should be freshly prepared. Systematic cardiac treatment may be required.

3. An equable and warm climate may promote comfort, especially for elderly persons.

4. If the presence of bronchiectasis be suspected treat the case as one of bronchiectasis.

5. Acute exacerbations of chronic bronchitis may be treated much as is acute bronchitis, but severe symptoms generally indicate that some form of pneumonia has developed, and treatment should be regulated accordingly (p. 121).

6. Codeine sulphate or heroine hydrochloride should not be used consecutively over long periods on account of the danger of forming a habit.

7. The bronchitis of overfed patients is often benefited by depletion. Exclude gout as a factor.

Note. — Much improvement may be hoped for but cure is hardly to be expected in chronic bronchitis.

BRONCHIECTASIS.

Note. — The disease is chronic, lasting for thirty years, more or less. The patient may be subjected to recurring attacks of broncho-pneumonia, or of hemoptysis. Many patients have emphysema or asthma.† The condition is often diagnosed

* There is increasing reason to believe that cases of supposed chronic bronchitis, in the great majority of instances, are in reality pulmonary tuberculosis, bronchiectasis, or slight cardiac insufficiency.

† Empyema, abscess, arthralgia, or pneumothorax occur in rare instances.

wrongly as bronchitis or tuberculosis. Many cases are traceable to influenza. The sputum, typically, is abundant, purulent, greenish, nummular, can be raised at will by coughing, and often contains abundant influenza bacilli as well as various other organisms. Repeated examinations may be necessary to demonstrate the influenza bacilli. The cavities may be localized in one lobe or disseminated throughout both lungs. Nutrition is generally good. As the physical examination may show only a few râles, the diagnosis must rest on the history, the character, and the amount of the sputum.

TREATMENT.

No method yet devised offers hope of cure.

Efforts must be directed to relieving the patient as far as possible from unpleasant symptoms.

1. Teach the patient to drain his cavities on rising in the morning, and, if necessary, once or twice later in the day. This can be facilitated by taking a drink of hot water, tea or coffee at such times. Potassium iodide fr. 5 to 10 grs. (or 0.3 to 0.65 gm.) or other expectorants may be used if the secretion be too viscid to come up readily.

2. Avoid sedatives because they check free expectoration. The material then decomposes in the cavities and gives a foul odor to the breath and to the sputum.

3. In extreme instances of retained secretion the condition with its dyspnoea and cyanosis may simulate bronchial asthma. A differential diagnosis can be made from history and sputum. An emetic will give immediate relief by clearing the lungs.

4. Most of these patients are better in warm weather. A uniformly mild climate may relieve but cannot cure.

5. Sputum must not be swallowed because diarrhoea may result.

6. Foul-smelling sputum means inefficient drainage of cavities. The odor can be ameliorated by the use of 3 min. (or 0.2 c.c.) of Eucalyptol on a lump of sugar several times daily.

7. When the disease is localized in one lobe of the lung the chance of relief by surgical means may be considered.

PULMONARY TUBERCULOSIS.

By JOHN HAWES, 2ND, M.D.

Synonyms.— Consumption, Phthisis, Tuberculosis of the lungs.

Etiology. The tubercle bacillus, discovered by Robert Koch in 1882. Among predisposing factors may be mentioned an inherited weakened constitution or predisposition to the disease; overwork, or bad conditions of work, such as the dangerous trades; poverty and poor living conditions; bad habits — alcohol, etc; certain acute diseases, such as measles and whooping cough, etc.; or in fact, anything which may lower the resistance of the body to infection.

COURSE OF THE DISEASE.

Pulmonary tuberculosis is a chronic disease, usually lasting from two to seven years. In certain acute cases, where there is either an overwhelming amount of infection or a great lack of resistance, it may run a rapid course, ending fatally in a few months, or even weeks. In such cases, toward the end at least, the disease is not confined to the lungs but takes the form of a general septicæmia. Likewise, in certain chronic cases it may last in semi-active form for fifteen or twenty years or more. These are the exceptions, however. The usual type of the disease, as above mentioned, runs a course of from two to seven years, with intermissions of long or short duration during which time the disease is in a condition of arrest, or semi-arrest. The object of treatment is to make these periods of arrest as permanent as possible.

COMPLICATIONS AND SEQUELÆ.

1. Tuberculosis elsewhere in the body, especially the throat and genito-urinary tract.
2. Hemorrhage.
3. Cardiac Weakness, due to the toxins generated by the tubercle bacillus.

DIAGNOSIS.

Do not wait for extensive signs in the lungs, nor for a positive sputum before making the diagnosis and *instituting treatment*. Pay special attention to constitutional signs and symptoms, such as evening fever and rapid pulse, subnormal temperature and rapid pulse, loss of weight, strength and energy, etc. Remember

that in most instances a hemorrhage from the mouth means pulmonary tuberculosis and also that most pleurisies, especially wet pleurisies, are tuberculous. Depend more on the thermometer and common sense than on the stethoscope and remember that "absence of proof is not proof of absence."

PROPHYLAXIS.

1. Destruction of all sputum. See that the patient uses sputum cups, flasks, or cloth or paper napkins which can be burned, according to the amount of sputum.

2. See that the patient is trained to place his hand or handkerchief in front of his mouth on coughing or sneezing.

3. Separate the children to as great an extent as possible from all sources of infection, whether adults or other children.

4. Mechanical cleanliness—soap, water, scrubbing, repainting and papering is the best means of treating the rooms or premises in which a consumptive has lived, in order to make them safe.

5. Observance of the ordinary rules of hygiene and right living, as to work, sleep, play, food and drink, is the best plan for the average person who wishes to avoid this disease.

TREATMENT IN GENERAL.

Treatment should be active and aggressive. It should begin as soon as the physician has made the diagnosis; in certain cases, this may be before he has seen fit to tell the patient definitely that he has consumption. In the vast majority of instances, it is far better to talk frankly and plainly to the patient. If the diagnosis is certain, tell the patient; if you are in doubt, and merely suspect that tuberculosis is the cause of the symptoms, explain the situation frankly and clearly to the patient and to his relatives and friends. In no other way can coöperation be secured.

Methods of treatment include the following:

1. Sanatorium treatment.
2. Home treatment.
3. Climatic treatment.
4. Tuberculin.
5. Heliotherapy, or sunlight treatment.
6. Drugs.

SANATORIUM TREATMENT.

Every consumptive, at some time or other during the period in which he is trying to regain his health, should spend some time at a sanatorium. The length of time necessary to spend in this way may be short or long, according to the intelligence and finances of the patient and the nature of his disease. In selecting a sanatorium, the physician should consider the following points:

- (a) Cost per week.
- (b) Accessibility.
- (c) Climate and altitude.
- (d) Temperament and disposition of the patient.
- (e) Length of time patient expects to remain at the sanatorium.

HOME TREATMENT.

This is usually necessary before and after the patient has been at a sanatorium or some similar institution. The essentials of successful home treatment are:

1. Adequate and detailed supervision of the patient by physician and nurse.
2. Close coöperation between patient and physician.
3. Provision for outdoor sleeping.
4. *Prolonged rest.*
5. Finances sufficient to insure proper food and nursing.

CLIMATIC TREATMENT.

Before sending a patient a considerable distance, in order to give him the benefit of a certain climate, the physician should consider the following points:

1. The cost of transportation and the cost of board after arrival.
2. Will the patient be happy so far from home?
3. Has the patient funds enough to remain at least one year?
4. See that the patient is placed immediately under high-grade medical advice.
5. In case the patient has had hemorrhages, will it be safe for him to go on account of the altitude?

6. Do not send patients far away from friends, no matter how favorable the climate, if they are in the advanced or progressive stages of the disease.

7. Remember that even if the patient gets an apparent arrest of his disease in a certain favorable climate, it may be impossible for him to live in any other climate, or to return home to live with his relatives and friends with safety.

TUBERCULIN TREATMENT.

The general practitioner should not undertake this form of treatment.

HELIO THERAPY OR SUNLIGHT TREATMENT.

This may be tried in certain cases of pulmonary disease under most careful supervision. The physician should not try it, however, until he has made a careful study of the subject, and familiarized himself with all details.

TREATMENT BY DRUGS.

Drugs, in the treatment of pulmonary tuberculosis, are used merely to treat symptoms—never the disease itself. The intestinal tract must be kept clear, hence, saline or vegetable laxatives are often needed. Diarrhoea must be checked. Excessive, unproductive and irritating cough must occasionally be allayed. In certain instances, a mild tonic to stimulate appetite is indicated. Aside from these, no drugs are needed in the treatment of pulmonary tuberculosis.

ACUTE INFLAMMATION OF THE UPPER RESPIRATORY TRACT.

Etiology: infectious in most instances. The pneumococcus, staphylococcus, influenza bacillus, diphtheria bacillus, micrococcus catarrhalis or other bacteria may be causative. Among predisposing factors lowered physical resistance and exposure to cold are important.

Course of Disease. Inflammation generally begins in the nasopharynx (pharyngitis). It usually extends within a few days to the nasal mucous membrane (coryza) and often to the tonsils (tonsillitis) or larynx (laryngitis). The severity and extent of the inflammation depends chiefly on the kind and virulence of the infecting organism and on the resistance of the patient.

Complications and Sequelæ.

- | | |
|--------------------------------|---|
| 1. Bronchitis. | 8. Bronchiectasis. |
| 2. Otitis media. | 9. Septicæmia. |
| 3. Peritonsillar abscess. | 10. Meningitis. |
| 4. Lobar or broncho-pneumonia. | 11. Peritonitis. |
| 5. Arthritis. | 12. Inflammation of the antrum, frontal, ethmoidal or sphenoidal sinuses. |
| 6. Endocarditis. | |
| 7. Glomerulo-nephritis. | |

Diagnosis. Exclude whooping-cough, scarlet fever, measles and diphtheria. The diagnosis of diphtheria, in some cases, can be made by culture only. Therefore the safest plan is to take a culture in every case of inflammation of the throat and, if the report be negative but the signs suggestive of diphtheria to take another culture.

PROPHYLAXIS.

1. If there is a reasonable probability that the symptoms are due to diphtheria or to one of the exanthemata isolate the patient provisionally.

2. If the clinical evidence points to diphtheria administer antitoxin (p. 191) to the patient without waiting for the report on the culture; or even if the first culture be negative.



Prophylactic inoculation of all persons exposed to diphtheria should be insisted on.

3. Patients having infections of the respiratory tracts should cover the mouth on coughing or sneezing.

4. Good ventilation of rooms occupied by the patient reduces risk of contagion.

TREATMENT APPLICABLE IN GENERAL.

1. Keep the patient in a warm, but well-ventilated room at a uniform temperature.

2. Promote rest and sleep, using sedatives or hypnotics when needed.

3. Move bowels, at outset, by enema or cathartic unless they have been acting freely.

4. Allay unproductive or irritating cough by lozenge or sedative.

5. Avoid local irritation by tobacco or concentrated liquor.

6. Cleanse mucous membrane frequently, and soothe inflammation by means of a non-irritating gargle. Warm water, with or without salt or sodium bicarbonate in it, or *Liquor antisepticus alkalinus* (N.F.) may be used diluted with 3 parts of warm water.

7. Antipyretics, *e.g.*, phenacetin fr. 5 to 10 grs. (or 0.3 to 0.65 gm.), with caffeine citrate 1 gr. (or 0.065 gm.), or salicyl preparations (p. 203), may alleviate discomfort especially if there be fever, malaise or pain.

8. Food should be readily digestible and easy to swallow.

Abortive Treatment. This can be effective in the early stages only, and seldom even then. The following measures may be tried.

1. Cleansing, non-irritating gargle.

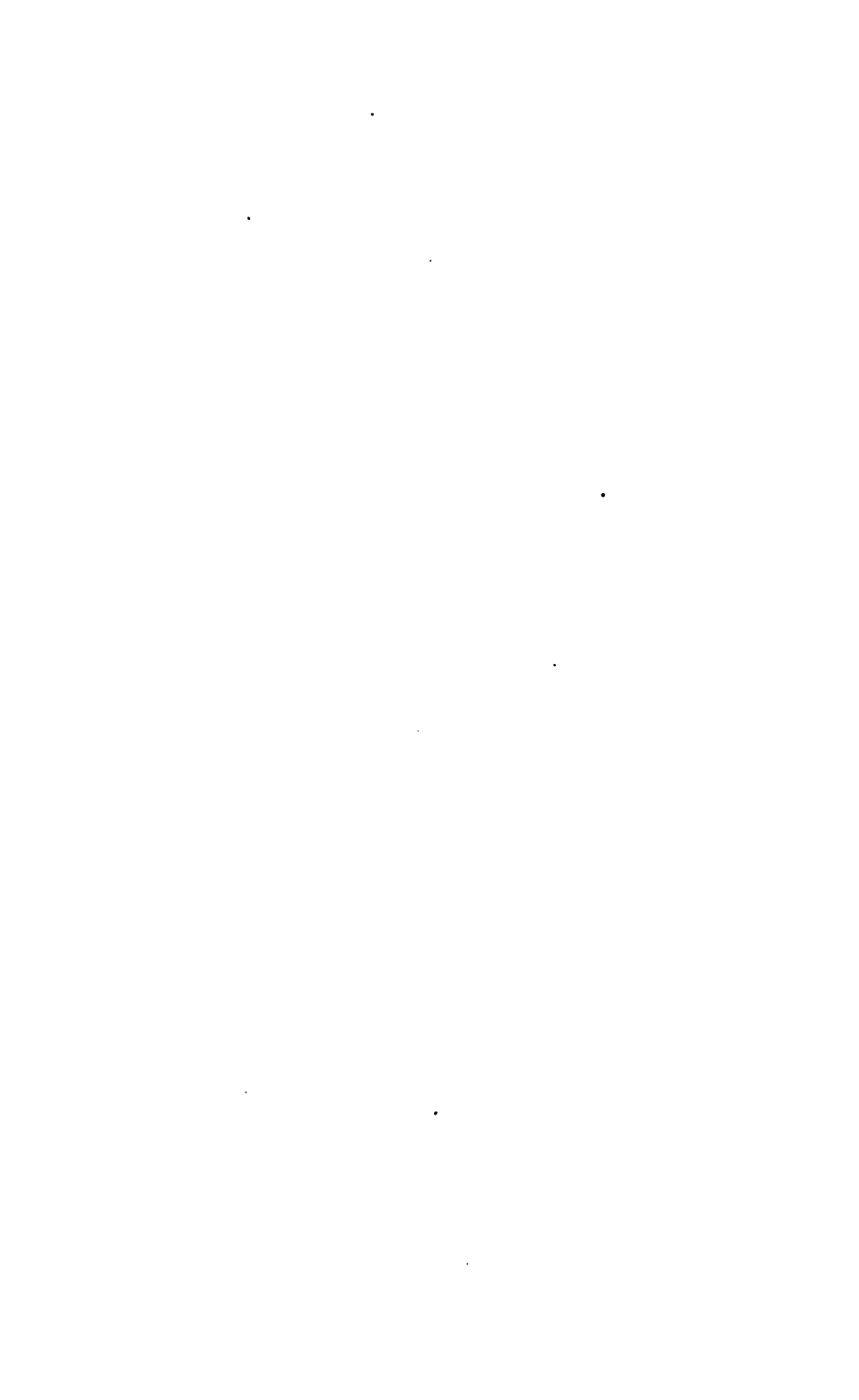
2. Hot bath before retiring, or

3. Hot drink on retiring to produce sweating.

4. Early to bed, and hypnotic unless sleep comes quickly.

5. Catharsis by calomel or saline.

6. The patient should dress in a warm room and avoid cold bathing on the following morning.



METHODS OF TREATMENT.

ACUTE PHARYNGITIS.

1. Cleansing gargle every four hours.
2. Oil spray * after gargle to protect and soothe mucous membrane.
3. Check cough with lozenges (p. 147) when possible. Otherwise use codeine or heroin.

CORYZA.

Keep the nose as free as possible from secretion.

Irrigation of the nose with an alkaline solution often gives much relief, but some physicians believe that this practice may lead to inflammation of the frontal sinus or middle ear. An oil spray * may be used to free the nasal passages.

If the secretion be profuse and watery, its quantity can be diminished by using $\frac{1}{100}$ gr. (or 0.00032 gm.) of atropine sulphate and repeating it in fr. 4 to 6 hours *s.o.s.* Atropine is contraindicated when secretion is viscid or tenacious. Excessive dosage causes dryness of the throat, increases discomfort, and may cause severe poisoning.

Atropine can be used in the form of Tr. of belladonna leaves; dose from 10 to 30 min. (or 0.6 to 2 c.c.).

ACUTE TONSILLITIS.

1. Take a culture.
2. Whereas the constitutional symptoms are apt to be severe it is generally advisable to keep the patient in bed.
3. Prescribe cleansing gargle to be used every four hours. The tonsils may be painted daily with argyrol,† fr. 10 to 20 per cent in watery solution.
4. An oil-spray,* used after gargling, may give some relief.
5. An ice-bag collar may help much to relieve pain in the throat.
6. The diet must be easy to swallow. Cold drinks may be grateful.

* Petrolatum liquidum will serve. Menthol 5 grs. (or 0.3 gm.) or Eucalyptol 5 min. (or 0.3 c.c.) or both can be added per oz. (or 30 c.c.) of liquid petrolatum. The De Vilbiss atomizer is good.

† U. S. t.

7. Occasional doses of phenacetin or of a salicyl preparation (p. 203) may be beneficial for fever, malaise or pain.

8. Opiates or hypnotics are indicated sometimes.

9. Salicylate (p. 203) in large doses acts well in some cases of tonsillitis having slight articular symptoms due probably to streptococcus infection.

10. Note at first visit the size, position and sounds of the heart, and the presence or absence of murmurs. Watch for any change and before discharging the patient, determine whether the heart or the kidneys have suffered.

ACUTE LARYNGITIS.

1. Scarification, intubation or even tracheotomy may be required for edema.

2. Steam, plain or medicated, ordinarily gives relief. It should be used every few hours or as desired. The steam can be inhaled from the mouth or from a pitcher containing boiling water. To the water may be added 1 drach. (or 4 c.c.) of compound tincture of benzoin. A steam atomizer which can be used to spray oil and steam together is still better. For very sensitive throats the steam and oil may act better without other ingredients, but Menthol 5 grs. (or 0.3 gm.), or Eucalyptol 5 min. (or 0.3 c.c.), or both can be added per oz. (or 30 c.c.) of Liquid petrolatum.

Excessive dryness of the air of the room is harmful. It can be mitigated by allowing steam to escape constantly from kettle or chafing dish.

3. Cough must be checked and talking minimized.

4. Smoking is especially harmful as a rule.

ACUTE TRACHEITIS.

Treatment as for laryngitis may suffice.

A flaxseed or mustard poultice * for the upper chest or steam inhalation may help to relieve substernal distress. Mustard should be avoided if resulting pigmentation would contraindicate its use. "Gomenol jujubes"† taken every 3 to 6 hours may relieve.

* See textbook on nursing.

† A preparation of *Oleum cajuputi* (U.S.).

CHAPTER IV.

GASTRIC AND DUODENAL ULCER.

INDICATIONS FOR MEDICAL TREATMENT.

1. Recent ulcers.
2. Chronic ulcers with mild symptoms.
3. Chronic ulcers which have not had satisfactory medical treatment.
4. Ulcers for which surgical treatment is too dangerous or has been refused.
5. As a preparation for operation.

The prognosis under medical treatment is better the more recent the ulcer.

PRINCIPLES OF TREATMENT.

The principles and methods are essentially the same whether the ulcer is in the stomach or in the duodenum.

1. Prolonged rest for the patient and for the digestive tract.
2. Avoidance of food mechanically or chemically irritating.
3. Reduction of gastric secretion to the minimum.
4. Good care of teeth.

METHODS.

A. Rest for a month or more is essential.

B. Diet should consist chiefly of soft carbohydrates, fats, milk, and eggs. Feeding should be frequent.

Treatment may be begun by starvation for several days, if the stomach be very irritable. Nutritive enemata are seldom, if ever, of much value because they are not well absorbed. During the period of starvation three pints of salt solution should be given daily by rectum. Cracked ice may be sucked to allay thirst.

Begin feeding with small quantities of milk (see Vomiting, p. 161). Later, bread, or crackers and milk, milk toast, strained

cereals with cream and sugar, rice, custard, blancmange, junket, simple ice cream, mashed or baked potato with cream or butter, eggnog, raw or soft boiled or dropped egg, purées, soft fruits, etc., can be added later to the dietary until the patient is taking ample nourishment.

The nutritive value of liquids can be much increased by adding to them sugar of milk, fr. $\frac{1}{2}$ to 1 oz. in 4 oz. (or fr. 15 to 30 gm. in 120 c.c.) of liquid. Cream may be added to milk, and butter should be used freely.

Irritating foods, *e.g.*, coarse vegetables, condiments, acids, and particularly alcohol must be avoided.

Hot drinks and meat broths, as a rule, should not be taken.

Proteid foods, in the opinion of the writer, are to be avoided, as a rule, except in the form of milk or eggs.

C. Modification of diet is required for patients that are emaciated, or feeble and anemic. For them starvation may be harmful, and it may be wise to begin feeding by mouth soon after the hemorrhage has stopped, and quickly to increase the amount of food ingested in order to accelerate healing by improved nutrition. The experience of the patient with the peculiarities of his digestion requires consideration.

In marked contrast to those expressed above are the views held by some physicians who advocate a diet consisting chiefly of proteid. Their aim by means of proteid is to neutralize the acid secretion as fast as formed. Frequent feedings are recommended with the same object.

Lenhartz is one of these, and his method may be preferred for some cases. His diet schedule follows, p. 157.

D. Reduction of gastric secretion * may be favored by starvation, by a diet low in proteid, by the avoidance of salt and by the administration of $\frac{1}{2}$ to 1 tablespoonful of olive oil several times daily.

E. Medication:

1. Sodium bicarbonate † should be prescribed freely for relief of pain or distress in the dose of fr. $\frac{1}{2}$ to 1 teaspoonful, or more if required, in a glass of water. A hot water bag may relieve.

2. After feeding has been begun bismuth subnitrate should

* Small doses of atropine are recommended by some physicians.

† Magnesium oxide is preferred by some physicians.

be given three times daily in teaspoonful doses *before* meals with the hope of benefit by coating the ulcer mechanically. Bismuth is not constipating in this dose. It is important that the drug should be pure.*

3. The bowels should be kept free by enema or by mild cathartics. Milk of magnesia acts well as a mild cathartic and also as an antacid.

D. Convalescence:

1. General hygienic measures including attention to the bowels are important.

2. Work should be resumed gradually and much fatigue, psychical more than physical, should be avoided.

3. Rest, lying down, for from $\frac{1}{2}$ to 1 hour after meals is of great benefit.

4. Food should be taken in the middle of the morning, the middle of the afternoon and at bedtime in addition to regular meals.

5. The more strictly the diet and regimen can be followed the greater the chance of success but it is better to enlarge the dietary than to undernourish the patient because good nutrition favors healing of the ulcer. The treatment should be followed as strictly as practicable for from six months to a year.

COMPLICATIONS: TREATMENT.

A. Hemorrhages, when small, require no special treatment.

When a severe hemorrhage occurs the patient should lie as still as possible and morphine should be given subcutaneously in dosage sufficient to bring the patient well under its influence and to inhibit peristalsis (p. 81). Further medication is not likely to do good.

An ice-bag may be placed over the stomach.

Stimulation of the circulation by salt solution, by transfusion of blood, or by drugs should be withheld unless demanded by immediate danger, because raising the blood-pressure may prolong the hemorrhage.

If syncope be feared after hemorrhage it may be advisable to raise the foot of the bed.

* Squibb's is good for this purpose.

Operation is seldom indicated during hemorrhage because most hemorrhages stop spontaneously, and because when the patient has become exsanguinated operation is dangerous.

Repeated hemorrhage is an indication for operation after the patient has recovered sufficiently from the resulting anemia. Transfusion may be advised to hasten recovery or to prepare for subsequent operation.

B. Perforation may be acute or subacute. It may lead to general peritonitis, to abscess, or to adhesions causing persistent, severe symptoms.

The acute perforations and those with abscess formation should receive prompt surgical treatment. Early diagnosis is very important.

C. Pyloric obstruction, when severe, requires operation. Incomplete obstruction with gastric dilatation can often be relieved temporarily and sometimes for long periods by rest in bed, lavage daily before breakfast, and a soft diet with limited liquids. Under such treatment the dilated stomach may contract and acute inflammation at the pylorus may subside.

This is an excellent preparation for operation. Operation should be urged early for pyloric obstruction because when symptoms make it imperative the weakened condition of the patient adds greatly to the risk.

D. Persistent severe symptoms which do not yield to medical treatment demand that operation be seriously considered.

LENHARTZ DIET *

Days after hemorrhage	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Number of eggs....	2	3 beaten			5	6	8 4 beaten 4 boiled	8	8	8	8	8	8	8	
Sugar with egg....	....	....	20	20	30	30		40	50	50	50	50	50	50	gm.
Milk †.....	200	300	400	500	600	700	800	900	1000	1000	1000	1000	1000	1000	c. c.
Raw mince †.....	....	....	....	....	....	35	2×35	2×35	etc.	....	....	....	....	....	gm.
Milk rice.....	....	....	....	....	....	....	100	100	200	200	300	300	300	400	gm.
Zwieback.....	....	....	....	....	....	....	....	20	40	40	60	60	80	100	gm.
Raw ham †.....	....	....	....	....	....	....	....	= 1 piece	....	50 etc.	....	....	....	....	gm.
Butter.....	....	....	....	....	....	....	....	....	....	20	40 etc.	....	....	....	gm.
Calories.....	280	420	637	777	955	1135	1588	1721	2138	2478	2941	2941	3007	3073	

* Ref. Wagner. Münch.-Med. Woch., 1904, page 1.

† Administer in spoonfuls, iceed.

‡ Cooked mince-meat or tender roast meat would be preferred by most non-Teutonic patients and physicians.

ACUTE INDIGESTION.

Pathology: Probably irritation, with hyperæmia, and possibly with inflammation of the mucous membrane of the stomach, of the intestines or of both.

Etiology: 1. Ingestion of food unwholesome either in itself or for the individual.

2. Excess of food.

3. Excess of alcohol or other beverage.

Diagnosis of indigestion is made by history and by exclusion.

Do not overlook the following diseases which may cause vomiting:

- | | |
|--|--|
| 1. Acute infectious diseases
including malaria. | 8. Brain tumor. |
| 2. Nephritis. | 9. Tabes dorsalis. |
| 3. Pregnancy. | 10. Angina pectoris. |
| 4. Migraine. | 11. Chronic gastric or intestinal diseases. |
| 5. Lead colic. | 12. Acute surgical conditions,
<i>e.g.</i> , appendicitis, cholecystitis, renal colic, etc. |
| 6. Hysteria. | |
| 7. Acute drug poisoning. | |

PRINCIPLES OF TREATMENT.

1. Rest and warmth for patient.
2. Removal of cause of symptoms.
3. Rest for digestive tract.
4. Symptomatic treatment.

METHODS.

Methods must be chosen with regard to the cause, severity and nature of symptoms.

1. **Rest and Warmth.** The patient should lie down and should be warmly covered or should remain in bed. Hot-water bags may be useful for cold extremities or for abdominal distress or pain. Rest and warmth diminish metabolic waste and promote recuperation.

2. **Removal of Cause.** If the distress is gastric, and if the stomach has not been freely emptied, emesis may be induced by administering quantities of warm water or by means of a teaspoonful of mustard-powder mixed in a cup of warm water.

If symptoms come from the intestine the bowel should be evacuated unless profuse diarrhoea has cleared it thoroughly. A saline cathartic, or calomel followed by a saline cathartic, may be of service if the stomach can retain it. An enema may be given at any time for prompt effect or if cathartics cannot be retained. Both emesis and catharsis are necessary for some severe cases.

3. Rest for Digestive Tract. Well-nourished patients generally do best without food of any kind for from 12 to 24 hours. Plain water or mineral water may be allowed in small quantities at short intervals.

When beginning to feed it is wise to use liquids, such as beef tea, chicken broth, hot milk or orange juice, a few ounces, every two hours. The nourishment should be increased in amount and in kind more or less rapidly according to the physician's estimate of the patient's digestive capacity. Hunger and a clean tongue generally indicate that considerable quantities of food can be assimilated; whereas a coated tongue and disgust for food mean the reverse.

6. Symptomatic Treatment.

(a) **Nausea** generally yields to rest and abstinence from food. Emesis is advisable for some cases.

(b) **Vomiting** usually stops spontaneously when the stomach has been emptied. If it does not yield to rest and abstinence from food it may be checked sometimes by a teaspoonful of shaved ice with brandy, by a drop of Tr. of iodine in a teaspoonful of water, by $\frac{1}{4}$ gr. (or 0.016 gm.) of cocaine hydrochloride dissolved in a teaspoonful of water, by $\frac{1}{4}$ gr. (or 0.008 gm.) of morphine sulphate absorbed from the mouth, by other drugs, or by gastric lavage. Food should be withheld entirely for from about 3 to 12 hours after vomiting has ceased. Water should be allowed during this period in very small amounts if at all. Cracked ice may be sucked for thirst.

When gastric disturbance lasts over a period of days, salt solution must be administered in the form of enemata, by rectal seepage or by hypodermoclysis. Three pints in 24 hours is enough. These measures and rectal feeding are very rarely needed in acute gastritis.

Feeding should be resumed cautiously, using milk diluted with mineral-water, lime-water, or carbonated water; or orange

juice, or broth in teaspoonfuls every half hour. The quantity of nourishment should be increased and the intervals between feedings lengthened gradually.

(c) Diarrhœa should not be checked until all old fœcal matter has been discharged. If the diarrhœa persists in a mild form a few doses of about 15 grs. (or 1 gm.) of bismuth subnitrate may suffice to stop it. When diarrhœa is severe opiates are often required. A teaspoonful of paregoric may be prescribed after each loose movement. Morphine may be required subcutaneously. For other medicaments see below.

(d) Colic can be checked, when slight, by the application of heat to the abdomen and by rest and abstinence from food.

Paregoric or other preparations of opium or morphine may be used for severe pain but they are contraindicated in full dosage until the intestinal tract has been cleared, and also when conditions which may require surgical interference cannot be ruled out.

SIMPLE DIARRHŒA.

DIAGNOSIS.

Do not overlook the following diseases which may cause diarrhœa.

1. Dysentery, bacillary or amœbic.
2. Other infectious diseases, *e.g.*, typhoid.
3. Nephritis with colitis.
4. Carcinoma of lower bowel.
5. Fœcal impaction with intermittent diarrhœa.
6. Rectal diseases with tenesmus.
7. Mucous colitis.
8. Reflex or nervous diarrhœa, *e.g.*, due to chill, exophthalmic goitre, or perhaps to anxiety.
9. Habitual excess in eating and insufficient exercise.
10. Irritating ingesta or imperfectly digested food.

PRINCIPLES OF TREATMENT.

Suit methods to severity, duration and persistence of symptoms:

- (a) Remove irritant, usually imperfectly digested food.
- (b) By means of a suitable diet avoid further irritation.

- (c) Limit peristalsis.
- (d) When there is toxemia, dilution and elimination of toxins is important.

METHODS.

A. To Remove Irritant. Unless bowel has been thoroughly evacuated prescribe a purge which will act quickly and ascertain that this result has been obtained before proceeding to other kinds of medication.

A saline, or castor oil, may be used. If these are vomited an enema may do good. It may be advisable to induce emesis (p. 159). Calomel generally acts well (p. 211).

B. The Diet should be non-irritating; should leave little residue; and, preferably, should be digested high up.

Eggs, broths and lean meats are well digested as a rule.

Starches containing little cellulose may be preferred occasionally.

Fats, fruits and coarse vegetables in general are to be avoided. Liquids should be bland and not cold.

C. To limit peristalsis. (a) Rest, preferably in bed.

(b) Restriction of ingesta. Meals should be small and frequent. In severe conditions of short duration food and liquids may be forbidden entirely for a time. The length of time depends on the state of nutrition and tolerance of the patient.

(c) Warmth, externally and internally, *i.e.*, a warm room, avoidance of changes of temperature, a hot-water bag on abdomen and hot drinks.

MEDICATION.

(a) **Astringents.** Bismuth subnitrate, fr. 10 to 20 grs. (or 0.65 to 1.3 gm.) every 2 to 8 hours.

Acidum tannicum (U. S.), boiled green tea, red wine, or Tannalbin* may be tried.

(b) **Sedatives.** Opiates are best, *e.g.* Tr. opii camphorata (U. S.), "Paregoric," or Tr. opii deodorati (U. S.), or Misturæ contra diarrhoeam (N. F.), as "Cholera mixture," "Squibb's Diarrhoea Mixture," and others, or "C. O. T. pill"† containing Camphor 1 gr. (or 0.065 gm.), Opium $\frac{1}{4}$ gr. (or 0.016 gm.), and Tannic acid 2 grs. (or 0.13 gm.).

* U. S. t.

† Not official.

CONSTIPATION.

Constipation is a symptom seen in many diseases, some functional, some organic. The treatment should combat the cause or causes in the individual case. Hence, a clear understanding of every case is of prime importance.

CLASSIFICATION OF CONSTIPATION.

I. Spasmodic Form: 90 per cent of all cases.

- (a) Mucous colitis.
- (b) Neurasthenia.
- (c) Lead poisoning.
- (d) Intra-abdominal or pelvic inflammation.
- (e) Fissure of anus.

II. Atonic Form.

Muscular weakness or general debility due to:

- 1. Fevers.
- 2. Anæmia.
- 3. Cachexia.
- 4. Senile debility.

III. Obstructive Form.

- (a) Stricture.
- (b) Adhesions.
- (c) Pressure from tumor or pregnancy.
- (d) Ptosis with kink.
- (e) Acute obstruction.

IV. Less common varieties of constipation are excluded from lack of space.

Diagnosis of stricture, adhesions and ptosis or kink can seldom be made satisfactorily without bismuth x-rays, but x-ray evidence is often misleading.

PRINCIPLES OF TREATMENT.

A. The essential causes of chronic constipation are *neurasthenia* and *bad hygiene*. Therefore it is imperative to encourage the patient as well as to correct his habits.

B. Clear the intestinal tract thoroughly and keep it clear, including the rectum.

C. Soothe or stimulate the bowel by suitable diet as required.

E. Use cathartics sparingly or not at all, and avoid undue irritation of the bowel by them.

F. Prescribe sufficient liquid in definite quantity.

G. Enjoin proper mastication of food and prescribe false teeth if needed.

H. Instruct patient about regularity in defecation.

I. Exercise or abdominal massage, unless contraindicated, may help sedentary persons.

METHODS FOR SPASMODIC CONSTIPATION.

Mucous Colitis. 1. Non-irritating diet composed chiefly of carbohydrate with a moderate amount of fat and a little easily assimilable proteid. Avoid foods rich in cellulose, acids, spices, tea, coffee and alcoholic beverages.

The following list of suitable foods is not complete, and should not be followed too closely in all cases. The experience of the patient may be valuable. Fresh milk, cream, butter, sugar, rice, macaroni, sago, tapioca, strained oatmeal, cream of wheat, white bread or toast, potato, baked, boiled or mashed, junket, custard, blanc-mange, eggs, boiled, poached, scrambled or shirred, finely minced chicken or lamb, boiled tongue, or tender steak if it can be well chewed. Do not starve the patient.

2. Bowels must be kept clear by injections of oil in the evening to be retained during the night, and by cleansing enemata, preferably of warm normal salt solution, every morning.

3. Cathartics are particularly injurious to an irritated or inflamed mucous membrane and abdominal massage may do more harm than good. "Russian Oil" or Agar-agar, p. 217, act well together and are non-irritating.

4. When the stools begin to appear normal the regimen can be relaxed. Finally, the patient can drop the injections entirely and return to a mixed diet *rich in cellulose and fruit* to stimulate normal defecation.

5. Colonic irrigations with or without appendicostomy may perhaps be tried in very obstinate cases. I have not seen them used and have never advised them for colitis secondary to chronic constipation.

Lead Poisoning with Constipation. Antispasmodic medication with morphine or atropine is required.

Intra-abdominal or Pelvic Inflammation or Fissure of the Anus may cause constipation by reflex spasm. Treatment demands removal of the cause by appropriate means.

METHODS FOR ATONIC CONSTIPATION.

Post-febrile constipation, being transient, may be treated with mild laxatives for convenience.

Constipation in Anæmia, Cachexia, or Senile Debility. The patient's convenience should be considered, especially in ambulatory cases, or when the chance of ultimate cure is small. *Nux vomica* may be of service, and mild laxatives, glycerine suppositories, or enemata may be advised according to circumstances. Fæcal impaction should be guarded against and watery catharsis must be avoided. Massage may do good and mechanical support may aid defecation when the abdominal wall is weak.

A diet, rich in cellulose, fruits, and sugar, may help to stimulate peristalsis. Graham bread, oatmeal, cracked wheat, green vegetables, beets, carrots, turnips, tomatoes, raw or stewed fruits and jams are particularly to be recommended for those who can digest them.

METHODS OF TREATMENT FOR OBSTRUCTIVE CONSTIPATION.

(a) **Stricture.** Operation will generally be required. Palliation by means of "Russian Oil" by mouth, or by rectal injections of oil followed by cleansing enemata may be beneficial.

(b) **Adhesions.** The palliative measures just mentioned may suffice. Exercise or massage may do good. Operation may be advisable.

(c) **Pressure.** Palliate or operate according to circumstances.

(d) **Ptoxis.** A suitable abdominal supporter may relieve. Other palliative measures and exercise or massage may help. Operation offers little hope of relief, as a rule.

(e) **Acute Obstruction.** Prompt operation is imperative.

METHODS USEFUL IN VARIOUS KINDS OF CONSTIPATION.

I. Massage daily may be very beneficial.

"Cannon-ball Massage." A heavy ball is necessary. A 12- or 16-lb. "shot" (made for athletics) and covered with leather

or strong cloth will serve. Once or twice daily the patient, lying on his back, should roll the shot repeatedly around the abdomen * from the cæcum along the course of the colon for 15 minutes before going to the toilet.

II. Enemata. (a) In long-continued constipation the rectum may never empty itself completely ("dyschezia"). As a result the reflex to defecation may be lost. This reflex can sometimes be regained after a course of oil injections at night, followed by cleansing enemata in the morning. Olive or linseed oil is suitable. From 4 to 6 oz. (or fr. 120 to 180 c.c.) should be used at each injection and the oil should be retained through the night.

(b) Cleansing enemata of warm water with the addition of Sod. bicarb. or of salt 1 drach. (4.0 gm.) to the pint (500 c.c.) can be used when irritation of the mucous membrane is to be avoided.

(c) Cold water, hot water, or soap suds and water are more potent than salt solution or warm water.

(d) Strong enemata, consisting of glycerine fr. 1 drach. to 1 oz. (4 to 30 c.c.); or of Sat. sol. of Mag. sulph., glycerine, and water aa 2 oz. (or 60 c.c.) can be used if required.

III. Laxatives should be used only in conjunction with suitable diet, abundant liquid (6 to 8 glasses of water daily) and hygienic habits. No one laxative suits all persons.

(a) Fl. Ext. of Cascara sagrada can be used in doses of 10 or 15 min. (or 0.6 to 1 c.c.), after meals, or in a single dose of fr. 10 min. to 30 min. (or 0.6 to 2 c.c.) at bed-time. When regularity of the bowels has been established the dose of Cascara can be diminished drop by drop until medicine is no longer required.

(b) Prunes and Senna. Instruct patient to stew 3 dozen prunes with two tablespoonfuls of Senna leaves (enclose leaves in a cheese-cloth bag), and to eat 10 prunes once or twice daily. When the bowels have been regular for a time the amount of Senna can be reduced until prunes only are taken. Later, the number of prunes can be reduced.

(c) Russian Oil or Agar-agar (p. 217) may be tried. They act mechanically and do not irritate the intestines.

* The abdominal muscles should be relaxed while the ball is being rolled.



CHAPTER V.

DRUGS.

FOREWORD.

He who masters the use of a few good drugs will succeed better than he who tries many at random.

Before prescribing a drug, let the indications for its use be clear.

Prescribe drugs singly when expedient.

Ascertain whether an idiosyncrasy to the drug you wish to prescribe is known to the patient.

When a drug has been given, watch for its good or for its toxic effect. Increase dose until the one or the other is apparent. If neither results, change either the preparation or the drug.

If toxic effects occur, omit the drug for a time and resume it later in smaller dosage or try a substitute.

EXPLANATION.

The purpose of the list which follows is to indicate the important drugs and the preparation of each believed to be the most generally useful. The dosage recommended is suitable for the average adult and may require modification for the individual.

Much useful information is contained in the "United States Dispensatory." It describes the drugs of the principal pharmacopœias, the preparations of the "National Formulary," and many unofficial preparations. "New and Non-official Remedies" gives information about many proprietary drugs. The writer's information about patents and trademarks was derived from this book. It is published yearly by the American Medical Association.

ABBREVIATIONS.

U. S. United States Pharmacopœia, 8th Rev.

Br. British Pharmacopœia.

N. F. National Formulary.

U. S. p. and t. United States patent and trademark.

N. N. R. New and Nonofficial Remedies, 1914.

U. S. D. United States Dispensatory, 19th Ed.

SYNOPSIS OF DRUGS.

I. SALVARSAN.*

Action. Kills certain pathogenic organisms in the living body. It may irritate the kidneys or liver but seems to have no toxic effect *per se* for other organs.

Elimination. Excretion rapid, chiefly in urine and *fæces*. When the excretory organs act normally, most of the drug is eliminated on the first day and nearly all within three or four days after an intravenous injection.

Toxic effects. 1. Signs of renal irritation or diminution of kidney function.

2. Jaundice.

3. Erythemia.

4. Hyperemia and swelling at the site of syphilitic lesions; *i.e.*, "Herxheimer reaction." To this group probably belong many of the dangerous symptoms arising within three days of the injection. Among them may be mentioned headache, vomiting, earache, syncope, convulsions and coma.

5. Fever developing gradually after a day or two may result from rapid destruction of spirochætæ.

Accidents or errors which may cause severe symptoms or death:

1. The "water-error," *i.e.*, contamination of the distilled water (used for solution) with bacteria living or dead; or with chemical impurities from the distilling apparatus. Symptoms often attributed to water-error are rigor, rapid rise in temperature, gastro-enteric disturbances, etc. †

2. Impurity of NaCl or of NaOH used in the solution.

3. Oxidation of the Salvarsan may be followed by signs of arsenical poisoning, gastro-enteric disturbance, peripheral neuritis, paraplegia, etc.

4. Accidental use of an acid instead of an alkaline solution. The former is 10 times more toxic than the latter.

5. Errors in technic of injection; may result in venous thrombosis and pulmonary embolism.

* U. S. p. and t. Diarsenol is being extensively used as a substitute for Salvarsan. They are extremely similar if not identical in action.

† There are those who believe that the symptoms attributed to the "water-error" are due to other causes, *e.g.*, overdosage.

6. Use of Salvarsan in unsuitable cases.
7. Lack of preparation, or of after-care of the patient.
8. Excessive dosage for the individual under existing circumstances, or too early repetition of dose.
9. Combined effect of various factors above mentioned.
- 10: Neurorecurrence. It appears after weeks or months and is a recurrence of syphilis, not an effect of Salvarsan.

Indications. Suitable cases of syphilis, relapsing fever, yaws, and various other diseases. Salvarsan is not dangerous when used wisely and with the best technic.

Contraindications are relative rather than absolute. The use of Salvarsan is particularly dangerous when the patient has:

1. Aneurism, coronary sclerosis, myocarditis, evidence of angina pectoris, or other severe lesions of the circulatory system.
2. In non-syphilitic nephritis.
3. In diseases of the liver, pancreas, or adrenal glands.
4. When there is advanced degeneration of the nervous system.
5. Profound anemia, or pronounced cachexia not due to syphilis.
6. Severe pulmonary lesions, or marked physical weakness from any cause.

Caution is advisable when there are:

1. Syphilitic lesions of the central nervous system, or when their presence is indicated by changes in the spinal fluid or suggested by slight symptoms.
2. In the secondary stage of syphilis.
3. When the patient is alcoholic.
4. Shortly after fatigue or exertion.
5. When excess of any kind, work, or travel, cannot be prevented for a time after the injection.
6. In old age, or when there is advanced arteriosclerosis.

Administration. An infusion apparatus consisting of a glass receptacle with an *opening at the bottom*, a rubber tube provided with a glass window at the lower end, a clamp and a needle will suffice. At the Massachusetts General Hospital salt solution is used to establish the flow. When nearly all the salt solution has left the receptacle the Salvarsan is poured in. Salt solution is poured in again to clear the needle before it is withdrawn. Care is taken to prevent the entrance of air into the vein. About

five minutes is allowed for the passage of the Salvarsan into the vein, and the rate of flow is regulated by the height of the receptacle.

This operation requires strict asepsis at every step.

Dose. Speaking of the use of Salvarsan in syphilis, Ehrlich says: "The dose depends entirely on the type and stage of the disease." Ordinarily, fr. 0.1 to 0.6 gm.* is used at intervals of from 5 to 10 days. In rare instances smaller or larger doses may be tried.

Caution. When danger is to be feared begin treatment with a series of very small doses at long intervals, or an energetic course of Mercury. The combined use of large doses of Salvarsan and of Mercury at the same time is believed to be unsafe.

Note. — Alternate courses of Salvarsan and of Mercury are to be recommended for syphilis.

NEOSALVARSAN.

Action. Like that of Salvarsan but less powerful in equal dosage.

Toxic Effects. Similar to those of Salvarsan but milder with equal dosage.

Indications. In may be preferred to Salvarsan because easier to prepare, or when toxic effects are feared.

Contraindications. As for Salvarsan.

Administration. Use *immediately*, because contact with air causes rapid decomposition. Do not mix the drug until everything is prepared and the needle already in the vein.

Dose. 0.9 gm. of Neosalvarsan contains the same quantity of arsenic as 0.6 gm. Salvarsan.

Preparation of Alkaline Solution of Salvarsan for Intravenous Use.

Printed instructions for preparing the solution are provided with the drug.

Technic of the Massachusetts General Hospital.

1. Everything used for preparing the solution is sterilized beforehand, and is handled under strictly aseptic precautions.

* The full dose of 0.6 gm. is being used less frequently, and smaller doses more frequently now at the Mass. Gen. Hosp.

2. The solution is mixed in an 8-oz. bottle which should have a glass stopper. The bottle is graduated for 100 and 200 c.c. Similar ungraduated bottles should be used for dispensing.

3. The drug is dissolved in the mixing bottle by hard shaking with about 50 c.c. of 0.6 per cent salt solution instead of distilled water. Solution takes place rapidly without the aid of beads.

4. To a dose of 0.6 gm. of Salvarsan thus dissolved 5 c.c. of normal NaOH solution is added and the mixture is again shaken until *perfectly clear*. Salt solution is then added to make 200 c.c.; the dispensing bottle is rinsed with the solution; the solution is filtered back into the dispensing bottle, and after insertion of the stopper, the neck of the bottle is covered with sterile gauze, which is held in place by a pin. The drug is then ready for use.

Salvarsan may decompose within a few hours. It should be kept cool until needed, and should then be warmed only a little.

List of Things Required for Preparing Solution.

1. Burette graduated to c.c., containing normal NaOH solution.
2. Flask of 0.6% NaCl solution.
3. Glass funnel and filter paper.
4. One graduated and one plain 8-oz. bottle having glass stoppers.
5. Basin of antiseptic containing also the ampule of Salvarsan, a file and a pin.
6. Sterile sheet and sponges.

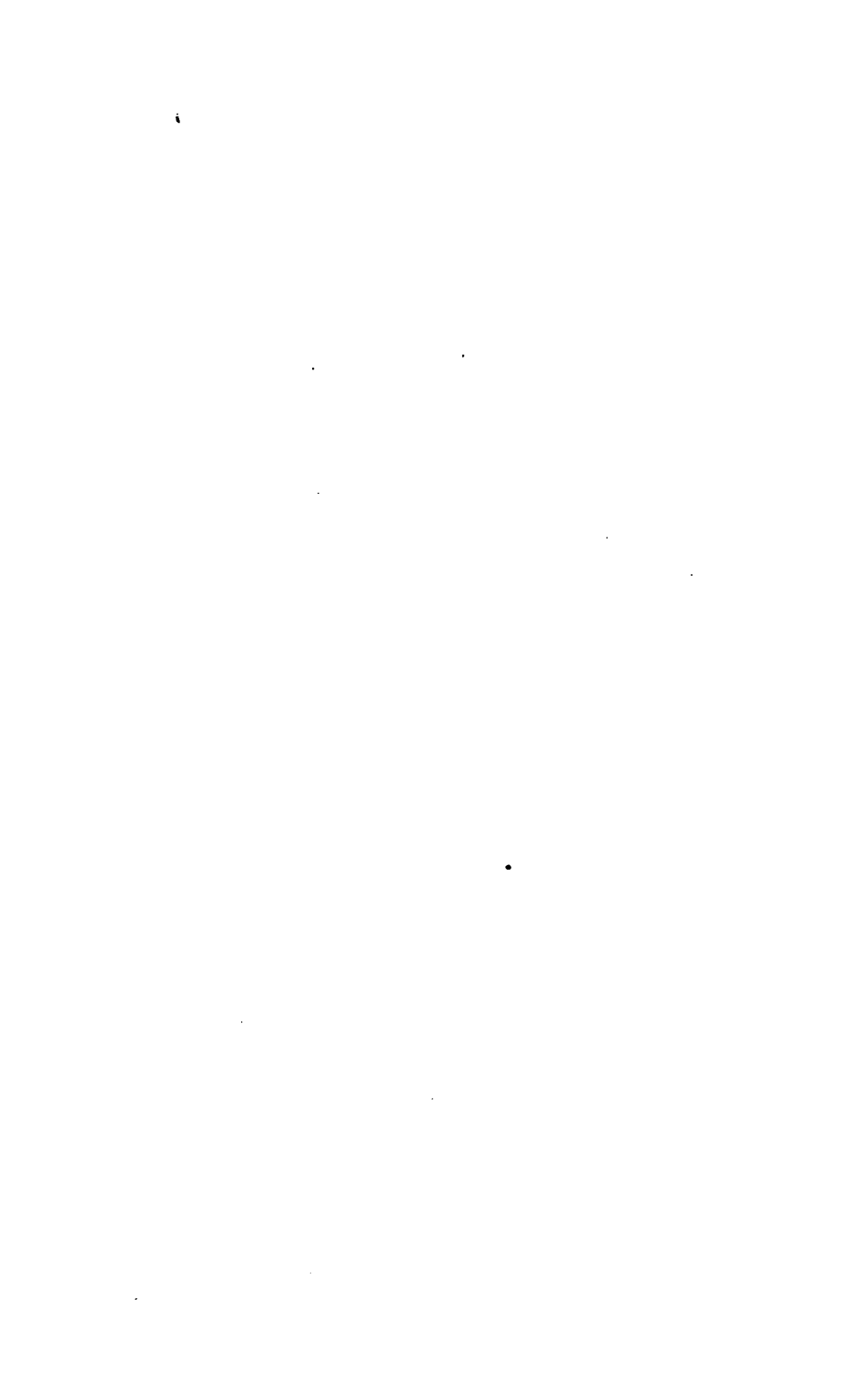
2. HYDRARGYRUM.

"Mercury."

- (a) Hydrargyri salicylas.* "Neutral mercuric salicylate."
- (b) Hydrargyri chloridum corrosivum (U. S.). "Corrosive sublimate," "Bichloride of mercury."
- (c) Unguentum hydrargyri † (U. S.). "Mercurial ointment."

* Not official in U. S. There is also a basic salicylate of mercury (Merck). It is used at the Massachusetts General Hospital.

† Conts. about 50% of Mercury by weight. Ung. Hydrarg. Dil. (U.S.), "Blue ointment," conts. about 33% of Mercury.



(d) *Hydrargyri iodidum flavum* (U. S.). "Protiodide or yellow iodide of Mercury."

Action of the above preparations is essentially the same: anti-syphilitic, local irritant, and antiseptic.

Elimination. Chiefly by intestines and kidneys; also in saliva. Excretion is slow.

Toxic Effects: *Acute Poisoning:* stomatitis, salivation, renal irritation, diarrhoea, abdominal pain and gastric disturbance.

Chronic Poisoning: cachexia, anemia, etc.

Indications: Syphilis. The choice of a mercurial preparation depends on the stage and severity of the disease, the condition of the patient, and the circumstances under which the treatment is to be carried out. Each of the four preparations mentioned above has advantages lacking in the others.

Contraindications. Nephritis unless luetic, cachexia, anemia.

Administration and Dose.

(a) *Hydrargyri salicylas:* nearly insoluble; single dose fr. 10 to 15 min. (or 0.6 to 1 c.c.) of a 10 per cent emulsion of the drug in *Petrolatum*; repeat in from 5 to 10 days. Inject into the gluteal muscle. Use a platinum needle $1\frac{1}{2}$ in. long.

(b) *Hydrargyri chloridum corrosivum:* soluble; single dose fr. 7 to 15 min. (or 0.5 to 1 c.c.) of a 1 per cent solution of the drug in a 10 per cent watery solution of Sodium chloride; repeat in 1 or 2 days. Inject into the gluteal muscle. Use a platinum needle.

(c) *Unguentum hydrargyri:* administer by inunction. Dose fr. $\frac{1}{4}$ to 1 drach. (or 2 to 4 gm.). Efficiency depends much on thoroughness of application.

(d) *Hydrargyri iodidum flavum;* administer in pills by mouth. Dose: $\frac{1}{4}$ gr. *t. i. d.* (or 0.013 gm.) and upward, increasing gradually until the first signs of intolerance appear. Then reduce dose by half and continue.

Caution. When mercurials are given, the mouth must be kept scrupulously clean to avoid stomatitis. Teeth should be brushed and throat gargled after every meal. If there is pyorrhoea alveolaris, the gums may be scrubbed with castile soap or swabbed daily with a 1 per cent solution of Potassium permanganate, applied with cotton stick; also rinse or spray mouth with Hydrogen peroxide. When giving the Protiodide of Mercury and Sodium or Potassium iodide also, give the Pro-

tiodide *a. c.* and the Potassium iodide *p. c.* to prevent formation of the Biniode of Mercury. When using large doses of any mercurial, the bowels should be kept clear, and the food should be readily digestible, nutritious and ample in quantity.

Note. — The reader is advised not to use Mercury in large doses or by injection unless familiar with the details of its administration, dosage and indications. Gottheil gives an excellent account in Forchheimer's "Therapeusis of Internal Diseases."

3. POTASSII IODIDUM. (U. S.)

"Iodide of Potash."

Properties. White, crystalline, very soluble in water.

Action. 1. Causes disappearance of gummata; but a lesion which disappears while iodides are being taken is not necessarily syphilitic.

2. Increased fluidity of mucus in respiratory tract.*

3. Seems to increase thyroid activity.

Elimination. Rapid, chiefly in urine as salts, partly in saliva.*

Toxic Effects: **Acute:** Acne, erythema, and other serious skin lesions, catarrh of respiratory organs, gastric disturbances, delirium, etc. **Chronic:** loss of weight, nervousness, anemia.

Indications. 1. Late stages of syphilis.

2. Bronchitis with sticky expectoration.

3. Empirically in arteriosclerosis, asthma, lead poisoning, simple goitre, and many other conditions.

⚡ **Contraindications.** Acute renal irritation, acute inflammation of the respiratory tract, and "hyperthyroidism." It may be harmful in phthisis.

⚡ **Administration.** 1. For syphilis, fr. 10 to 20 grs. (or 0.6 to 1.3 gm.) *t. i. d. p. c.* in milk. For syphilis of central nervous system, increase dose rapidly until benefit or iodism results. One hundred grains (or 6.5 gm.) *t. i. d.* is large enough dosage. The sat. sol. in water is convenient: 1 min. = 1 gr. or 0.065 gm.

2. As expectorant give fr. 5 to 10 grs. (or 0.3 to 0.6 gm.) *t. i. d. p. c.* well diluted.

3. For empirical action use small doses.

* Bastedo.

Substitutes. For syphilis: other preparations of Iodine, Mercury, or Salvarsan.

As expectorant: Ammonium chloride.

4. DIPHTHERIA ANTITOXIN.*

Action. Curative in diphtheria.

Absorption. It is absorbed slowly from the subcutaneous tissues, the process lasting for several days.

Toxic Effects. Urticaria, erythema, joint-pains, etc.

Indications. Clinical diphtheria; and for those exposed to diphtheria.

Contraindications. Never absolute. Dangerous in sufferers from horse asthma. It is doubtful whether a single dose of antitoxin ever produces sensitization in humans sufficient to cause anaphylactic shock on administering a second dose.

Administration. By injection into the loose subcutaneous tissues of the abdominal wall or below the angle of the scapula.

Intravenous injections are best for severe cases.

Dose. The dose should be gauged according to the severity of symptoms, duration of illness, and extent and location of the membrane.* Large doses are indicated when the larynx, trachea, or nasopharynx is much involved, and especially in virulent diphtheria.

Therapeutic dose for adults, fr. 5000 to 100,000 units. For immunization, fr. 1000 to 2000 units.

5. MORPHINÆ SULPHAS. (U. S.)

“Morphine” or “Morphia.”

Properties. White, crystalline, soluble in about sixteen parts water; less soluble in alcohol.

Action. 1. Diminishes sensibility to lasting impressions and stimuli. (Sollmann.)

2. Relieves pain.

3. Slows respiration and heart-action. (Bastedo.)

4. Diminishes metabolism.

* Manufactured by Departments of Health and by pharmaceutical firms. It can be obtained from the State Board of Health in Massachusetts free of charge.

5. Diminishes peristalsis; therefore, constipating.
6. In acute cardiac dilatation gives relief.
7. In colic or intestinal spasm it may act as a cathartic.

Elimination. Chiefly by gastro-intestinal tract. Some is oxidized in the body.

Toxic Effects. 1. Somnolence or stupor.

2. Respiration very slow and may become shallow and irregular (Cushny).

3. Pupillary contraction.

4. Flushing or cyanosis of face.

5. Retention of urine.

6. During recovery from drug nausea is common.

7. Death results from depression of respiratory center.

Indications. Acute conditions with, —

1. Severe pain.

2. Discomfort preventing sleep.

3. Acute cardiac insufficiency.

4. Internal hemorrhage (gastric, pulmonary, intestinal).

5. Persistent vomiting.

Contraindications.* 1. Danger of forming habit. In chronic or recurring non-fatal diseases, and in conditions which can be relieved by milder means, use morphine with caution if at all.

2. When bronchial secretion is profuse, morphine may prevent necessary expectoration: see pneumonia, p. 123.

3. Idiosyncrasy: causes excitement, vomiting, depression.

Administration. For urgent conditions give subcutaneously in the dose of fr. $\frac{1}{4}$ to $\frac{1}{2}$ gr. (or 0.008 to 0.032 gm.), with or without atropine sulphate, fr. $\frac{1}{200}$ to $\frac{1}{100}$ gr. (or 0.00032 to 0.00052 gm.). Morphine is generally given by mouth in tablet, in watery solution, or in a mixture. Morphine can be absorbed from the mouth and will then act more quickly than if swallowed. Atropine given with morphine tends to diminish the gastric disturbance which may follow. Atropine produces toxic symptoms if repeated often.

* Codman believes that morphine after abdominal operations may induce gastric dilatation; and Bastedo says it should not be used when there is "much depression of respiration, as in edema of the lungs, Cheyne-Stokes breathing and some cases of pneumonia," or in "acute dilatation of the stomach or bowels." "It should be employed cautiously in nephritis, especially if there is any uremic tendency," and in "infancy and old age."

Substitutes. Opium in pill, as tincture, or in suppository.

1. *Pilulæ opii* (U. S.): conts. opium 1 gr. (or 0.065 gm.) (= morphine $\frac{1}{4}$ gr. or 0.008 gm.).

2. *Tinctura opii deodorati* (U. S.). Dose fr. 5 to 15 m. (or 0.3 to 1 c.c.).

3. *Tinctura opii camphorata* (U. S.) — “Paregoric.” Dose for adult fr. 1 to 4 dr. (or 4 to 16 c.c.).

4. *Codeinæ sulphas* (U. S.). $\frac{1}{4}$ to $\frac{1}{2}$ gr. (or 0.008 to 0.032 gm.).

5. *Heroinæ hydrochloride*, the diacetic ester of morphine, not official; dose $\frac{1}{12}$ gr. (0.006 gm.).

6. *Hyoscinæ hydrobromidum* (U. S.). Dose fr. $\frac{1}{150}$ to $\frac{1}{100}$ gr. (or 0.00033 to 0.00065 gm.) subcutaneously. Combined with morphine it may act better than either.

6. **TINCTURA DIGITALIS.** (U. S.)

“Tincture of Digitalis.”*

Action. 1. Increases force of cardiac systole.

2. Lengthens diastole and slows heart action.

3. Raises blood-pressure if pressure is low.

4. Promotes diuresis when there is dropsy.

Absorption slow; therefore 24 hours or more is required for result. Action may be cumulative because excretion is slow.

Toxic Effects. Tachycardia or bradycardia with irregularity, heart-block, pulsus alternans, fall of blood-pressure, oliguria, vomiting, headache.

Indications. Myocardial insufficiency in general, with or without valvular disease. Almost useless in circulatory weakness resulting from vascular dilatation or from depletion.

Tachycardia, *per se*, does not call for digitalis.

Contraindications. When increase of blood-pressure would be dangerous, *e.g.*, cerebral hemorrhage.

When heart-block is developing use digitalis cautiously if at all.

Administration. Prescribe with water *p. c.*

Ordinary dose: fr. 5 to 20 m. *t. i. d.* (or 0.32 to 1.3 c.c.). If preparation is weak, higher dosage may be required. Tincture should be assayed physiologically.

* Parke, Davis & Co. and Burroughs, Welcome & Co. and Squibb assay their tinctures physiologically. I have used the former and found it good. The others are, probably, equally reliable. Powdered leaves in pills of 1 gr. each may be preferred.

When quick action is required, fr. 20 to 30 min. (or 1.3 to 2 c.c.) may be injected intramuscularly. It is a local irritant.

To prevent cumulative effect, keep bowels free.

Substitutes. 1. "Digipuratum."* Dose fr. 1 to 4 tablets in twenty-four hours. Each tablet contains $1\frac{1}{2}$ grs. (or 0.097 gm.) of digipuratum and is about equal in strength to 15 m. (or 1 c.c.) of the most active tincture of digitalis. Its therapeutic action is like that of the tincture but the effect comes more quickly and digestive disturbance is rare. This drug should act in fr. 12 to 24 hours.

"Digipuratum-solution" can be obtained in vials, each containing $1\frac{1}{2}$ grs. (or 0.097 gm.) of the drug, and this dose, or half of it, can be injected intramuscularly. The effect can then be expected in about half an hour. The same preparation acts in about 10 minutes when used intravenously. The injection should be given very slowly. Single doses of fr. $\frac{1}{2}$ to $1\frac{1}{2}$ grs. (or 0.05 to 0.097 gm.) can be used intravenously.

2. Strophanthinum (U. S.).† Action on heart is like digitalis but effects are sudden and profound. Death may result if the patient has taken any preparation of the digitalis group within one week. On account of local irritant action strophanthin should be used intravenously, and to avoid shock the injection should be given very slowly over a period of not less than 5 minutes. Dose fr. 0.0005 to 0.001 gm.

7. NITROGLYCERIN.‡

"Glonoin," "Trinitrin."

Action. Lowers blood-pressure by dilating peripheral vessels. Acts within a few minutes; effect lasts about $\frac{1}{2}$ hour. In the presence of hypertension diuresis may result.

Toxic Effect. Flushing, sense of fulness in head, throbbing headache, faintness. Reduction of urinary output.

Indications. Angina pectoris.

Cardiac embarrassment	} when due to high pressure.
Headache.	

* U. S. p. and t.; very expensive. Cæsar & Lorets powdered digitalis leaves are good and less expensive. Digifoline (Ciba) is now being tried as a substitute for digipuratum which is very difficult to obtain.

† Boehringer's is good. It is marketed in vials containing 0.001 gm. of the drug in solution.

‡ Official only in the form of Spiritus glycerilis nitratis (U. S.)



Contraindications. Low blood-pressure.

Administration. Tablet triturate.* For quick absorption the tablet should be chewed and not swallowed.

Ordinary dose, $\frac{1}{100}$ gr. (or 0.00065 gm.) may be repeated frequently unless toxic symptoms result.

For some cases $\frac{1}{100}$ gr. (or 0.00032 gm.), or $\frac{1}{80}$ gr. (or 0.0013 gm.) is better. Larger doses may be required.

Substitutes. 1. Amylis nitris (U. S.). "Amyl nitrite."

Dose 3 to 5 min. (or 0.18 to 0.3 c.c.).

Acts very rapidly. Effect very transient.

May act when nitroglycerin fails.

Put up in "pearls" containing 3 or 5 min. (0.2 or 0.3 c.c.)

Break pearl and inhale from handkerchief.

Pearls † should break easily but not spontaneously.

2. Sodii nitris (U. S.). "Sodium nitrite."

Action like nitroglycerin, but lasts longer.

Best prescribed in watery solution.

Dose, 2 grs. (or 0.13 gm.).

8. "THEOBROMINE SODIUM SALICYLATE."‡

Properties. White pwd. v. sol. in water, taste unpleasant, turn brown on exposure to air.

Action. Diuretic; slightly irritating to the kidneys. Effect is produced in from twelve to forty-eight hours; lasts for from two to three days.

Toxic Effect. Vomiting.

Indications. Cardiac dropsy. (Useless or nearly so in pure renal dropsy.) Small doses sometimes act well in angina pectoris, p. 39.

Contraindications. Acute nephritis.

Administration. In capsules or in a cachet *p. c.*

Dose, 15 grs. (or 1 gm.) 4 *i. d.* If no result after 48 hours, double dose. Never prescribe it in these doses for more than 3 days at a time.

Substitutes. 1. Fluidextractum apocyni (U. S.) or "Canadian hemp." Action diuretic and like that of digitalis but milder. Dose, fr. 5 to 15 m. (or 0.3 to 1 c.c.). Effects oc-

* Tablets lose strength in time. To test them take $\frac{1}{2}$ tablet yourself.

† Allen & Hanbury's are good.

‡ A double salt of theobromine-sodium and sodium salicylate. It is official in Germany (N.N.R.). "Diuretin" is the "trade name" of a similar proprietary remedy.



casionally dangerous. Better prescribed as a fresh infusion (Wheatley) corresponding dose, fr. 5 to 10 min. (or 0.3 to 0.6 c.c.).

2. Theophylline.* Dose fr. 3 to 6 grs. (or 0.2 to 0.4 gm.) *t. i. d.* in powder with water or in capsule.

3. If kidneys are sound, Calomel may be used in the dose of 3 grs. (or 0.2 gm.) every four hours for from twenty-four to forty-eight hours or even longer. To reduce danger of salivation take precautions described under Hydrargyrum.

9. MAGNESII SULPHAS. (U. S.)

"Salts," "Epsom Salts" or "Bitter Salts."

Properties. Colorless, crystalline, very soluble in water, taste bitter.

Action. Hydrogogue purge in concentrated solution, cathartic in dilute solution.

Toxic Effects. Gastric irritation and vomiting. If given in concentrated solution it may be absorbed and may then cause severe poisoning characterized by oliguria, hematuria, slow respiration, paralysis of the intestines, extreme weakness and collapse.† The urine in poisoning shows a very high specific gravity owing to the excretion of the drug by the kidney. These effects are rare.

Indications. Dropsy or uremic states.

Contraindications. Weakness, emaciation, vomiting, menstruation, pregnancy.

Administration. Most easily taken in a cup of black coffee and most effective when taken 1 hour before breakfast or when the stomach is empty.

Dose. From $\frac{1}{2}$ to 1 oz. (or 15 to 30 gm.) followed by half a glass of water. Small doses with much water can be used for mild catharsis.

Substitutes. 1. Croton oil, fr. 1 to 3 min. (or 0.06 to 0.2 c.c.) in pellet of butter. If placed on the back of the tongue of an unconscious patient it will be swallowed.

2. Pot. bitartrate and Comp. jalap. pwd. \overline{aa} drach. 1 (or 4 gm.).

3. Elaterium (Br.) $\frac{1}{2}$ gr. (or 0.016 gm.) in tablet.

4. "Ten-ten," calomel and jalap. \overline{aa} grs. 10 (or 0.65 gm.).

* Not official. Under the name of "Theocin" it bears U. S. p. and t. (N.N.R.).

† Boos: Jr. A.M.A., Dec. 10, 1910.

10. QUININÆ SULPHAS. (U. S.)

"Quinine."

Properties. White, cryst., slightly sol. in water, taste very bitter.

Action. Specific for malaria, antipyretic; readily absorbed, and rapidly eliminated in urine.

Toxic Effects. Tinnitus, headache, vomiting, erythema; occasionally renal irritation, amblyopia, or cardiac depression.

Indications. Malaria.

Contraindications. Idiosyncrasy but patients are frequently mistaken in believing they cannot take quinine.

Administration. In capsule *p. c.* Dose, fr. 5 to 10 grs. (or 0.32 to 0.65 gm.) from 2 to 4 *i. d.* Larger doses may be required.

Substitute. 1. Quininæ hydrochloridum (U. S.)* fr. 7 to 10 grs. (or 0.5 to 0.65 gm.) daily, dissolved in water and given intramuscularly, or 30 grs. (or 2 gm.) in enema (Manson).

2. Craig recommends for pernicious malaria intramuscular injections of Quinine bihydrochloride† grs. $7\frac{1}{2}$ (or 0.5 gm.) dis. in water, 15 min. (or 1 c.c.) and repeated every 4 hours if necessary.

3. Quinine and urea hydrochloride† is more soluble and has been recommended in recent years. It is much used in surgery as a local anæsthetic and can be obtained in sterile solution in vials.

11. SODII SALICYLAS. (U. S.)

Properties. A white powd. sol. in water, taste sweetish and saline.

Action. Analgesic, antipyretic, and diaphoretic. It has a curative effect in some forms of rheumatism. It increases nitrogen elimination in the urine and acts as a cholagogue and diuretic. It is readily absorbed and is eliminated by the kidney.

Toxic Effects. Tinnitus, headache, vomiting, erythema, delirium and gastro-enteric disturbance. It is slightly irritating to the kidneys and unless given with alkali may cause albuminuria. Very large doses may cause drowsiness or coma.

* Soluble in 35 parts water.

† Not official.



Indications. Rheumatic fever and various forms of "rheumatism." Useless in the gonorrhoeal and in some other types of arthritis.

Contraindication. Acute nephritis or idiosyncrasy.

Administration. In tablet or capsule followed by a *full glass of water* unless the heart be insufficient. If large doses are to be used prescribe also enough sodium bicarbonate to render the urine alkaline and see that the bowels be kept free.

Dose. For rheumatic fever, 10 grs. (or 0.65 gm.) of sodium salicylate every hour until the patient is relieved of pain; then 10 gr. (or 0.65 gm.) every 4 hours until convalescence has been established; then fr. 20 to 30 grs. (or 1.3 to 2 gm.) daily for a month or more to prevent relapse. If toxic effects occur the medicine must be omitted until they pass off. It can then be resumed in smaller dosage or in different form. A vehicle, such as essence of pepsin, may be helpful. For mild cases of arthritis smaller doses may be sufficient. In chronic "rheumatism" fr. 5 to 10 grs. (or 0.3 to 0.65 gm.) taken fr. 2 to 4 *i. d.* may promote comfort.

Substitute. 1. Salicinum. (U. S.) Action and uses like sodium salicylate but weaker and causes less gastric disturbance.

2. Oleum gaultheriæ. (U. S.) "Oil of wintergreen." Should be given in milk, or in capsule. Dose, fr. 15 to 30 min. (or 1 to 2 c.c.).

Aspirin:* Acetylsalicylic acid. Incompatible with heat, moisture, alkalis, their carbonates and bicarbonates (*N.N.R.*) Dose as for sodium salicylate.

12. HEXAMETHYLENAMINA. (U. S.)†

Properties. Crystalline, readily sol. in water.

Excretion. Chiefly in the urine in the form of ammonia and formaldehyde or unchanged.

Action. When formaldehyde‡ is set free it acts as a urinary antiseptic. When the drug is excreted unchanged, as often happens, it is inefficient. It acts only in an acid urine.

* U. S. p. and t.

† "Urotropine," "Formin," and "Aminoform" are proprietary names applied to Hexamethylenamina. (*N.N.R.*)

‡ May give Fehling's reaction. (*Bastedo.*)

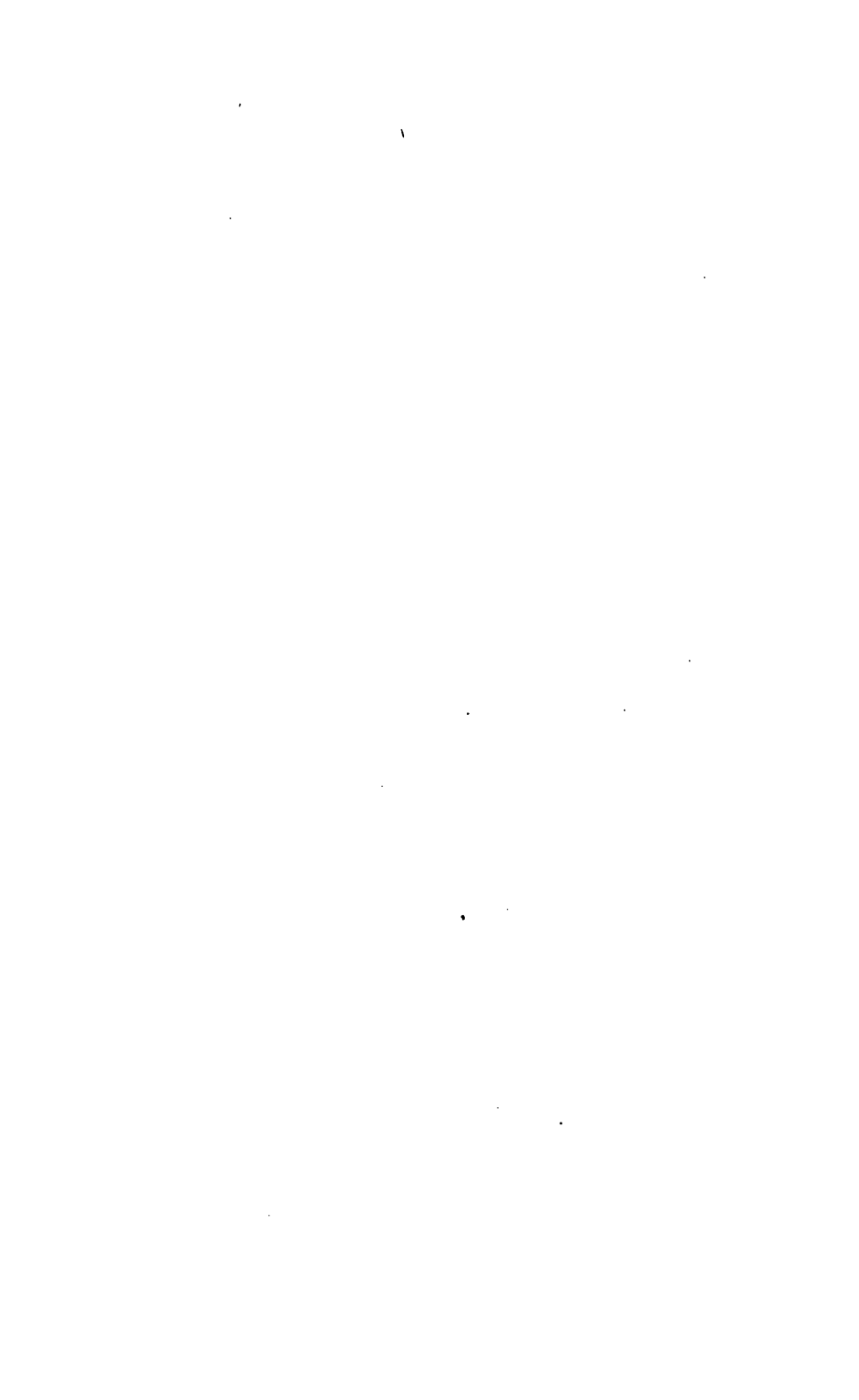


Toxic Effects. Renal irritation and hematuria, painful micturition and pain in the region of the bladder.

Indications. Especially useful in typhoid fever to prevent bacilluria and cystitis. It may act well in other cases of cystitis or pyelitis.

Contraindication. Acute nephritis.

Administration. In capsule or tablet. Dose from 5 to 10 grs. (or 0.3 to 0.6 gm.) *t. i. d.* with a full glass of water. When the urine is alkaline or neutral, acid sodium phosphate in the dose of 10 grs. (0.65 gm.) or more if needed can be prescribed to change its reaction, but this drug should not be administered *with* Hexamethylenamine because they are incompatible (Bastedo).



VALUABLE DRUGS.

13. Pilulæ ferri carbonatis. (U. S.) "Blaud's Pill."

Action: rubifacient, slightly constipating, turns stools black.

Used especially in chlorosis and secondary anemias.

Dose: pills of 5 grs. each (or 0.3 gm.); fr. 1 to 2 *t. i. d.*, *p. c.*

Substit. 1. Ferrum reductum. (U. S.) Dose, 1 to 3 grs. (0.065 to 0.20 gm.) 3 or 4 *i. d.* in pill or powd.

2. Liquor ferri et ammonii acetatis. (U. S.) "Basham's mixture." Dose, 1 dr. (or 4 c.c.).

14. Sulphonethylmethanum. (U. S.) "Trional."

Action: hypnotic, sol. in 195 water, more soluble in alcohol.

Toxic Effect: somnolence and mental and physical depression.

Used for wakefulness, sometimes for alcoholic delirium.

Dose: for sleep, fr. 5 to 15 grs. (0.3 to 1 gm.) in powd. by mouth. Larger doses may be used for delirium.

Prescribed in powder by mouth with water or in sol. by rectum.

Substit. "Veronal." (U. S. pat.) Dose, as for trional in powd. or tab.

15. (a) Sodii bromidum. (U. S.) "Sodium bromide."

(b) Potassii bromidum. (U. S.) "Potassium bromide."

Action: Mild sedative, lessens reflex excitability. Slightly irritating to the stomach.

Toxic Effect: Vomiting, acne, coryza, somnolence.

Used for nervousness, wakefulness, epilepsy, and to ward off alcoholic delirium.

Dose: Usually fr. 5 to 15 grs. (or 0.3 to 1 gm.) *t. i. d.*, or a single dose at night for sleep.

Much larger doses may be required for epilepsy and for alcoholic patients.

Prescribed in watery solution by mouth well diluted and *p. c.*, or, occasionally, by rectum.

16. Acetphenetidinum. (U. S.) "Phenacetin."*

Action: analgesic, antipyretic, mild diaphoretic, and sedative.

Toxic Effect: circulatory depression.

Used especially for migraine and occasionally for other painful conditions.

* Bayer's is the best.

Dose: fr. 5 to 15 grs. (or 0.3 to 1 gm.) in tab. or powder. A small dose may be repeated in an hour or more if necessary. Prescribe with caffein citrate, 1 gr. (or 0.065 gm.).

17. Pulvis ipecacuanhæ et opii. (U. S.) "Dover's Powder."

Action: mild opiate: hypnotic, sedative, diaphoretic, antipyretic and analgesic; slightly constipating.

Toxic Effect: When stomach is irritable vomiting may result.

Used generally in single dose in the evening for malaise or insomnia in acute infections such as "grippe," tonsillitis, or the exanthemata.

Dose: fr. 10 to 15 grs. (or 0.6 to 1 gm.) in pwd. by mouth.

18. Codeinæ sulphas.* (U. S.) "Codeine."

Action: mild opiate and sedative. Slightly constipating.

Toxic Effect: vomiting, generally on following day.

Used to allay unproductive cough.

Dose: fr. $\frac{1}{4}$ to $\frac{1}{2}$ gr. (or 0.008 to 0.032 gm.) in tablet, by mouth.

19. Sodii bicarbonas.† (U. S.) "Soda." "Saleratus."

Action: antacid.

Toxic Effect: gastric disturbance, not poisonous.

Used for "hyperacidity," in acidosis, and in acid poisoning; to render urine alkaline; and with salicylate in acute rheumatism.

Dose: fr. $\frac{1}{2}$ to 1 dr. (or 2 to 4 gm.) 3 or 4 i. d. with water by mouth. Larger doses may be required in acidosis.

20. Bismuthi subnitras. (U. S.) "Bismuth."

Action: mild astringent and antacid. Combines with H_2S in intestine to form a black, insoluble sulphide.

Toxic Effect: none with therapeutic dose.

Used for diarrhoea, "hyperacidity," peptic ulcer, and for intestinal fermentation.

Dose: for diarrhoea fr. 10 to 20 grs. (or 0.65 to 1.3 gm.) repeated after each loose movement. For peptic ulcer $\frac{1}{2}$ doses of 1 dr. (or 4 gm.) are used a. c. to coat the ulcer and to relieve distress. Prescribed in pwd. by mouth with water.

21. Hydrargyri chloridum mite. (U. S.) "Calomel."

Action: Mild purgative and supposed intestinal antiseptic. Diuretic. Antisyphilitic.

* Heroine hydrochloride may be preferred.

† Magnesii oxidum (U. S.) is preferred by Dr. R. C. Cabot.

‡ Use a pure preparation: e. g., Squibb's.

Toxic Effects: renal irritation, stomatitis, etc. (p. 187).

Use and Dose: 1. as a mild purge, either in the dose of $\frac{1}{16}$ gr. (or 0.006 gm.) every 15 m. for 8 or 10 doses and followed by a mild saline cathartic 1 hour after the last dose, or fr. 1 to 3 grs. (or 0.065 to 0.2 gm.) can be taken in single dose at night and the saline on the following morning.

2. As a diuretic: 3 grs. (or 0.2 gm.) every 4 hours for fr. 24 to 48 hours or until diuresis begins. When using this dose the usual precautions against poisoning must be taken (p. 187). Prescribe in tablet.

3. Calomel is preferred by many to salicylate of mercury for the treatment of syphilis by injection.

22. Oleum ricini. (U. S.) "Castor oil."

Action: mild purgative; acts in fr. 2 to 6 hours; after effect constipating. Do not prescribe it during menstruation or pregnancy.

Toxic Effect: not poisonous but may be vomited.

Dose: fr. $\frac{1}{2}$ to 2 ozs. or more (15 to 60 c.c.). Lemon juice or brandy helps to disguise the taste.

23. Fluidextractum rhamni purshianæ. (U. S.) "Fl. ext. of cascara sagrada."

Action: mild laxative. **Taste:** very bitter.

Toxic Effect: irritation of bowel.

Dose: fr. 10 to 30 m. (or 0.6 to 2 c.c.) at bed-time with water.

24. Vaccine virus.

The living virus of cow-pox is used as a prophylactic against small pox. The virus should be fresh, and a "take" or lesion of cow-pox is required to confer immunity.

Admin. 1. Clean skin with soap and water. Antiseptics, if used, must be washed off lest they kill the virus.

2. When dry, scarify skin very superficially without causing bleeding. A needle or any sharp instrument will serve.

3. Apply virus. After it has dried *completely* cover the spot with a sterile pad and secure it with adhesive plaster.

4. When the inoculation "has taken" the lesion should be bathed with antiseptics and dressed aseptically from time to time. Secondary infection and much pain can thus be avoided.

Note. — Virus is prepared by health departments nearly everywhere and is distributed free to physicians.

25. Typhoid vaccine.

A killed culture of typhoid bacilli standardized by count. Used for prophylactic inoculation against typhoid (p. 65).

In general, three doses are given subcut. at intervals of a week or ten days as follows: 500 million, 1,000 million, and 1,000 million.

The reaction is seldom severe. There may be fever and malaise.

The interval between injections should not be longer than 10 days lest anaphylaxis result.

Inoculation is strongly recommended for persons who travel, for nurses, physicians, soldiers and others who may be exposed to typhoid infection.

Note. — Prepared by health departments * and pharmaceutical firms.

26. Tuberculin.

Used for diagnostic tests and for treatment in suitable cases of tuberculosis. For detailed information see "Early Pulmonary Tuberculosis; Diagnosis, Prognosis, and Treatment," by John B. Hawes 2nd, M.D. (Wm. Wood & Co.)

There are several kinds of tuberculin. Koch's old tuberculin is a glycerine extract of tubercle bacilli. It is still used extensively.

27. "Normal salt solution."

Used by hypodermoclysis, intravenously, or by rectum, depending upon circumstances and object in view.

The common solution consists of 0.6 per cent of sodium chloride in distilled water.

Solutions are prepared also according to other formulæ which contain calcium and potassium chloride in addition to sodium chloride.

When prescribing specify formula desired.

28. Alcoholic beverages.

A. (a) Spiritus frumenti. (U. S.) "Whiskey."

(b) Spiritus vini Gallici. (U. S.) "Brandy."

Uses:

1. Quickly diffusible stimulant: dose by mouth, fr. 1 drach. to 1 oz. (or 4 to 30 c.c.). Dose subcut. 30 min. (or 2 c.c.).

* Distributed free in Massachusetts by the State Board of Health.

2. To promote appetite; best taken with meals and well diluted.

3. As a food in malnutrition when other foods are not absorbed in sufficient quantity. Alcohol is especially useful in selected cases of typhoid or septic infection.

Dose fr. 1 to 2 oz. (or 30 to 60 c.c.) diluted with water and repeated at intervals of fr. 2 to 6 hours. Larger doses are sometimes beneficial.

If odor remains on breath reduce dose or lengthen interval.

Champagne is often borne better than whiskey or brandy when the stomach is irritable.

B. Beer, ale, porter, or malt may be prescribed with meals to improve appetite and to promote increase of weight.

29. "RUSSIAN OIL"

Petrolatum liquidum (U. S.) and "Russian Oil" are liquid paraffins under the definition of the British Pharmacopœia, but "Russian Oil" is not liquid petrolatum because of a difference between Russian and American Petroleum. "Russian Oil" is more refined than is ordinarily the case with liquid petrolatum. The latter usually has a yellowish color and an unpleasant taste, but the former is colorless and tasteless.

Substitutes for "Russian Oil" should have similar general characteristics, should be tasteless, and of high specific gravity. Lighter oils seem less efficient, and sometimes escape through the anus involuntarily.

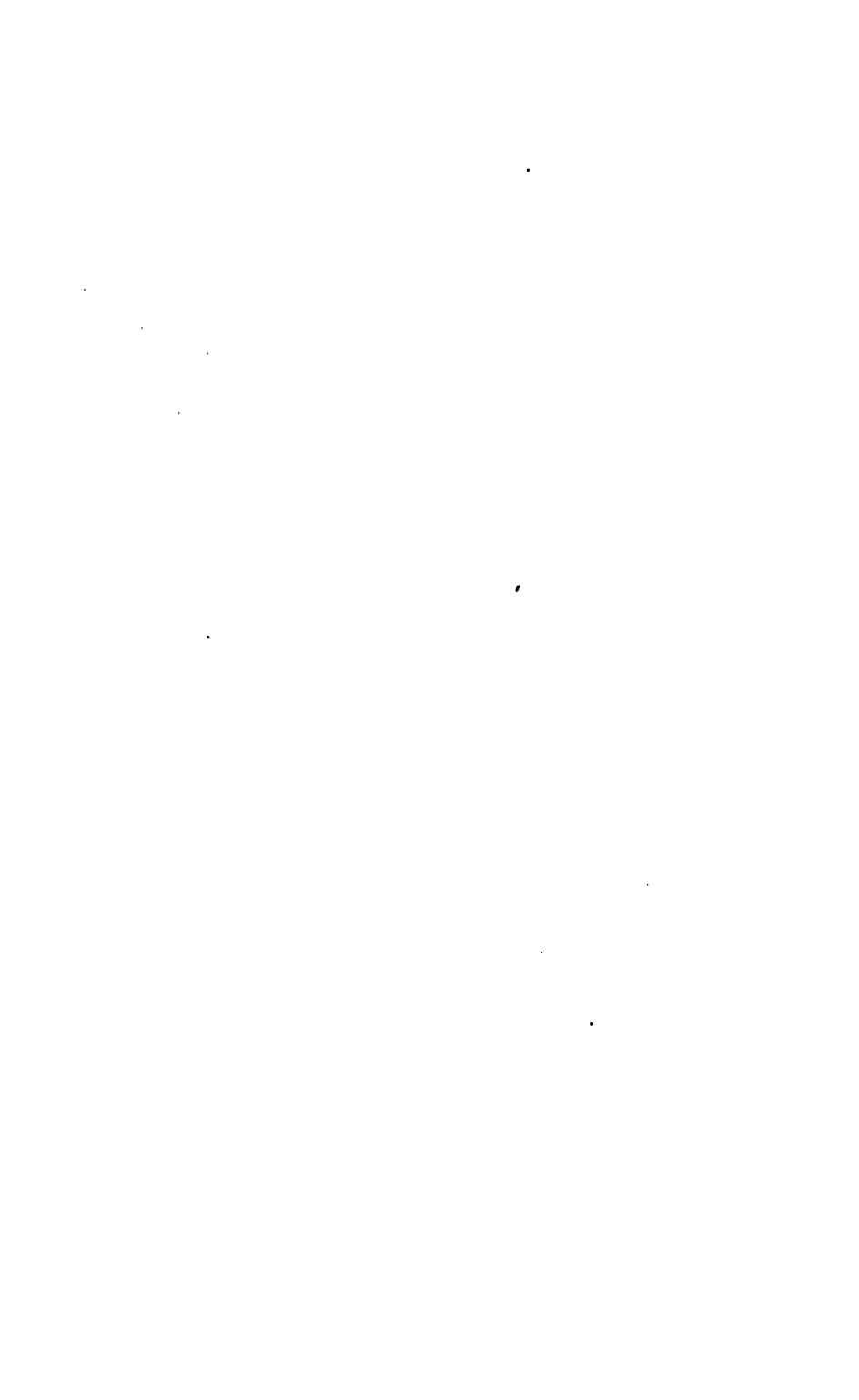
Action: A lubricant which passes unabsorbed and undigested through the intestine. Unlike olive oil it is not a food, and is less apt to disturb the digestion.

Used chiefly in chronic constipation, alone or in conjunction with other forms of treatment.

Dose from 1 to 3 tablespoonfuls twice daily; preferably several hours after a meal.

30. AGAR-AGAR.

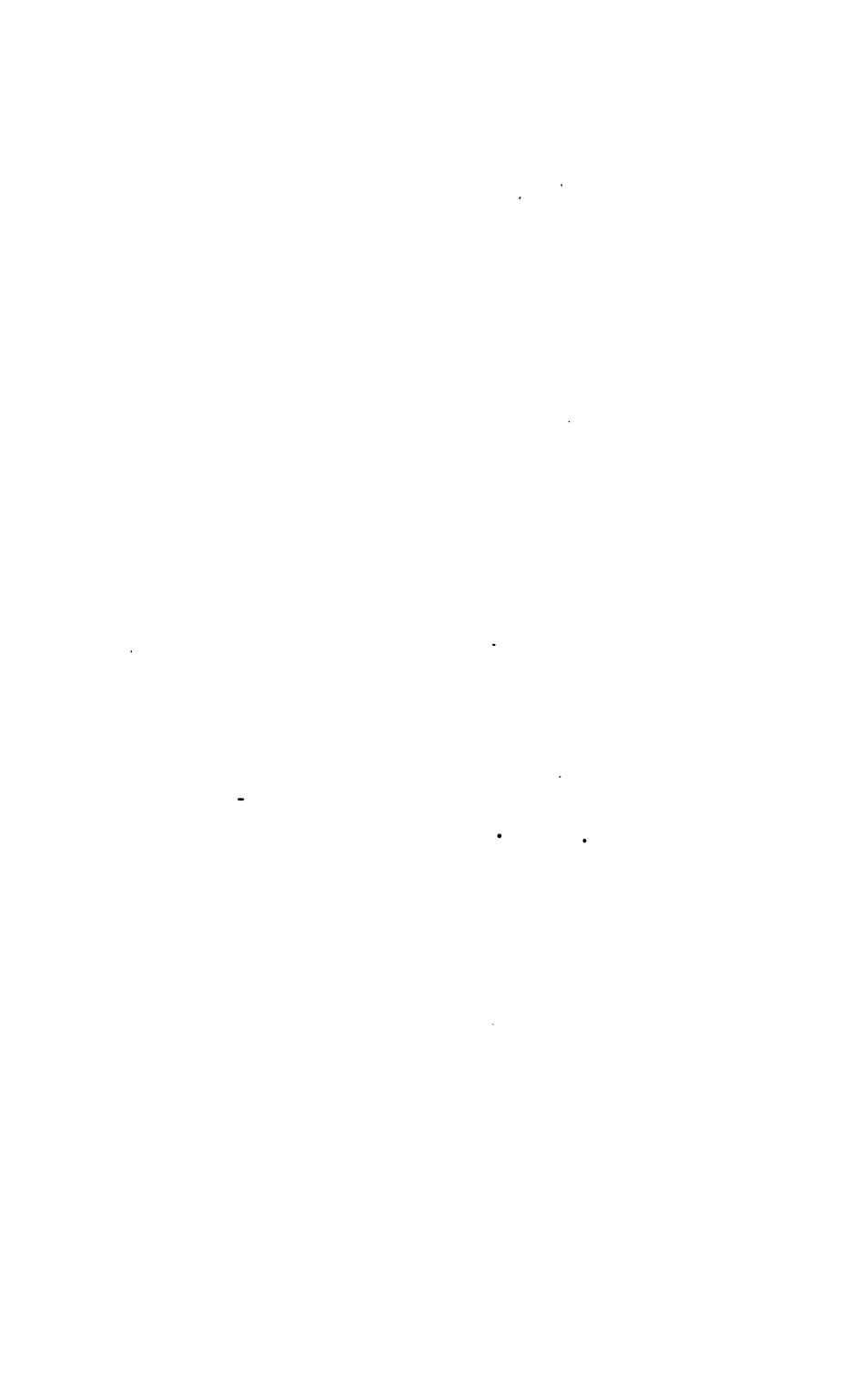
Action: Agar-agar swells tremendously by absorbing water, is not digested, and does not ferment in the intestinal tract. Therefore, it stimulates peristalsis and helps to sweep out the bowel.



Used in chronic constipation, generally in conjunction with other forms of treatment.

Dose from $\frac{1}{4}$ to 1 tablespoonful once or twice daily.

Administration: Powdered agar can be eaten on cereal. Granulated agar can be mixed with and washed down with milk or water. Agar-agar wafers are more attractive but expensive.



DRUGS VALUABLE FOR OCCASIONAL USE.

1. Thyroid extract.*
2. Liquor potassii arsenitis. (U. S.) "Fowler's solution."
3. Pilocarpinæ hydrochloridum. (U. S.)
4. Apomorphinæ hydrochloridum. (U. S.)
5. Vinum colchici seminis. (U. S.)
6. Quininæ hydrobromidum. (U. S.)
7. Hyoscinæ hydrobromidum (U. S.) { chemically
Scopolaminæ hydrobromidum (U. S.) { the same.
8. Caffeinæ sodio-salicylas. (N. F.)
9. Oleum tigllii. (U. S.) "Croton oil."
10. Elaterium. (Br.)
11. Adrenalin chloride solution, † 1 to 1,000.
12. Cocainæ hydrochloridum. (U. S.)
13. Atropinæ sulphas. (U. S.)
14. Strophanthinum. (U. S.) ‡
15. Apocynum. (U. S.)
16. Theophylline, § p. 201.
17. Emetine hydrochloride. §

* Not official. Burrough's, Welcome & Co.'s extract is good.

† U. S. t. Parke, Davis & Co.

‡ Boehringer's is good.

§ Not official.

DRUGS IN COMMON USE.

1. **Ferrum reductum.** (U. S.)
2. **Liquor ferri et ammonii acetatis.** (U. S.)
"Basham's mixture."
3. **Heroine hydrochloride,*** p. 195.
4. **Spiritus ammoniæ aromaticus.** (U. S.)
5. **Potassii bitartras.** (U. S.) "Cream of tartar."
6. **Potassii citras.** (U. S.)
7. **Pilula scillæ composita.** (Br.)
8. **Liquor antisepticus alkalinus.** (N. F.)
"Alkaline antiseptic."
9. **Liquor sodii boratis compositus.** (N. F.) "Do-
bell's solution."
10. **Caffeina citrata.** (U. S.)
11. **Strychninæ sulphas.** (U. S.)
12. **Tinctura nucis vomicæ.** (U. S.)
13. **Syrupus hypophosphitum.** (U. S.)
"Syrup of hypophosphites."
14. **Syrupus hypophosphitum compositus.** (U. S.)
"Compound syrup of hypophosphites."
15. **Phillips' Milk of Magnesia.†**
16. **Senna.** (U. S.) "Senna leaves."
17. **Glycerinum.** (U. S.)
18. **Tinctura iodi.** (U. S.)
19. **Tinctura belladonnæ foliorum.** (U. S.)
20. **Pilulæ catharticæ compositæ.** (U. S.)
"Compound Cathartic Pills."
21. **Pilulæ aloini, strychninæ, et belladonnæ.**
(N. F.) "A. S. and B. Pills."

* Not official.

† Proprietary.

WEIGHTS AND MEASURES.

METRIC SYSTEM.

1 kilogram (kg.) = 1 litre of distilled water at maximum density, *i.e.*, at 4° C. and 760 mm. pressure.

1 kg. = 1000 grams.

1.0 gm. = gram. (gm.).

0.1 gm. = decigram (dg.).

0.01 gm. = centigram (cg.).

0.001 gm. = milligram (mg.).

APOTHECARIES' OR TROY WEIGHT.

1 grain or gr. = 0.065 gm.

1 drachm (dr. or drach.) or \mathfrak{z} = 60 grs. or approx. 4 gm.

1 ounce (oz.) or \mathfrak{z} = 8 dr. = 480 grs. or approx. 30 gm.

1 pound (lb.) = 12 \mathfrak{z} or approx. 375 gm.

U. S. APOTHECARIES' OR WINE MEASURE.

1 minim (min.) or m. = 0.062 c.c. (or approx. 1 drop of water).

1 fl. drachm (drach. or dr.) or \mathfrak{z} = 60 m. or approx. 4 c.c.

1 fl. ounce * (oz.) or \mathfrak{z} = 8 dr. = 480 m. or approx. 30 c.c.

1 pint (O) = 16 \mathfrak{z} or approx. 480 c.c.

* 1 fl. oz. of water weighs 455.6 grs.

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